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PATENTS FOR INVENTIONS.

ABRIDGMENTS
OF
Specifications
RELATING TO
AGRICULTURE.

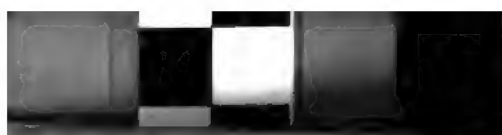
DIVISION I.
FIELD IMPLEMENTS
(INCLUDING METHODS OF TILLING AND IRRIGATING LAND).

A.D. 1618-1866.

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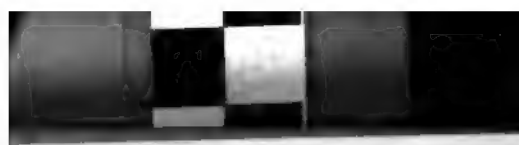
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P R E F A C E.

In **Indexes to Patents** are now so numerous and costly as to render their purchase inconvenient to a large number of inventors and others, to whom they have become indispensable.

To obviate this difficulty, short abstracts or abridgments of the **Specifications of Patents** under each head of invention have been prepared for publication separately, and so arranged as to form at once a **Chronological, Alphabetical, Subject-matter, and Reference Index** to the class to which they relate. As these publications do not supersede the necessity for consulting the **Specifications**, the prices at which the printed copies of the latter are sold have been added.

The number of **Specifications** from the earliest period to the end of the year 1866 amounts to 59,222. A large proportion of the **Specifications** enrolled under the old law, previous to 1852, embrace several distinct inventions, and many of those filed under the new law of 1852 indicate various applications of the single invention to which the Patent is limited. Considering, therefore, the large number of inventions and applications of inventions to be separately dealt with, it cannot be doubted that several properly belonging to the group which forms the subject of this volume have been overlooked. In the progress of the whole work such omissions will, from time to time, become apparent, and be supplied in future editions.

This volume contains **Abridgments of Specifications** to the end of the year 1866. It is intended to continue them to the end of the year 1876 as soon as the **Abridgments** of all the **Specifications** from the earliest period to the end of 1866 have appeared in a classified form. Until that takes place, the inventor can continue his examination of the **Specifications** relating to the subject of his search by the aid of the **Subject-matter Index for each year**.

The present series includes all inventions relating to the tillage of the land and the gathering in of the crop. For further treatment of the gathered crop, its storage, and all such processes as thrashing, winnowing, cleaning grain, &c, have been reserved for a second volume, which will form Part II. of this series. Prime movers used for agricultural purposes will also be treated apart.

Besides the more obvious classes of inventions which form the bulk of the series, the following may be mentioned as among the subjects dealt with in the following pages:—

Anchors and intermediate gear for ploughing, &c.

Coating corn previous to sowing.

Movable irrigators and machines for watering grass and other lands (but not pumps, syphons, &c. for which see "Hydraulics").

Clearing roots and stumps of trees from land.

The application of electricity for purposes of Agriculture.

Protectors for tobacco plants.

Agricultural drains and machinery for forming them.

Inventions relating to the following subjects have not been included in this series:—

The manufacture of drain tiles, &c. (see "Drains and Sewers.")

Manures and compounds for increasing crops (see "Manure.")

Engines, machines, and pumps for draining land (see "Hydraulics.")

Lawn mowing machines.

Spades, spuds, hand hoes, and hand rakes (except a few special ones).

Machinery for grinding and polishing various articles, amongst which scythes are mentioned.

H. READER LACK.

August, 1876.

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AGRICULTURE.

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DIVISION I.

FIELD IMPLEMENTS.

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# AGRICULTURE.

## DIVISION I.

### FIELD IMPLEMENTS

(INCLUDING METHODS OF TILLING AND IRRIGATING LAND)

A. D. 1618, January 17.—No. 6.

RAMSEY, DAVID, and WILDGOSSE, THOMAS.—A means of making "Newe, apte, or compendious formes or kindē of  
" engines or instrumentē, and other pfitable invencions, wayes,  
" and meanes," "to ploughe groundē without horse or oxen,  
" and to enrich and make better and more fertill, as well  
" barren beatē, saltē, and sea sandē, as inland and upland  
" groundē." The patent relates also to modes of raising water  
for supplying cities, towns, and houses at a cheap rate; and  
to a means of making boats for the carriage of burdens and  
passengers "runn vpon the water as swifte in calmes, and  
" more saff in stormes, than boatē full sayled in greate wyues."

[No Specification enrolled. Letters Patent printed, price 4d.]

A. D. 1619, May 23.—No. 13.

SHOTBOLTE, JOHN.—"A pfecte, true, and exacte way of  
" making, amending, and repairing our royall high way and  
" roads, as alsoe any other pticular waies and passages what-  
" soever, and alsoe for the speedy erecting, raising, newe  
" making, amending, and repairing of the mounndes and  
" branches of the sea, greate rivers, or other waters that may  
" overflowe, surround, or any way endaunger the waies or any  
" landes or groundes adonineing or neere to such waters as  
" aforesaid; as alsoe for the making, amending, clensing,  
" scowring, sinking, making cleane, and repairing of poudes,  
" stanckē, ditches, pooles, draines, rivers, and all manner of

" watercourses whatsoever, and that by the vse and helpe of  
 " certayne strong way ploughes, way harrowes, land steernes,  
 " scowlers, trundlers, and other strong and massy engines by  
 " him invented for that and such like pposes."

[No Specification enrolled. Letters Patent printed, *id.*]

A.D. 1623, November 25.—No. 27.

HAMILTON, ALEXANDER.—"A newe, easie, and pfitable  
 " engine, instrument, or devise, aswell for plowinge as for  
 " harrowinge and sowinge, seedinge, or settinge, of arable  
 " groundt with any kinde of corne and grayne at greater  
 " ease and with more pfit and encrease than by any other  
 " meanes ever heretofore vsed."

[No Specification enrolled. Letters Patent printed, *id.*]

A.D. 1624, January 22.—No. 28.

SHIPMAN, WILLM.—"The true and pfecte knowledge of  
 " sowing, setting, and planting of an herbe, roote, or plant  
 " called madder, and of bringing it to his full pfectiō of  
 " growth, and to the true and pfecte misterie, arte, and science  
 " of breaking, drying, dressing, and pparing the same for  
 " dying, which hath not hetherto bin vsed or practised and  
 " brought to such pfectiō by anie other."

[No Specification enrolled. Letters Patent printed, *id.*]

A.D. 1626, January 20.—No. 37.

FELTON, EDMUND, and DREWE, JOHN.—"Secrett wayes  
 " and meanes not heretofore vsed," "not onely therewith to  
 " conuey water from place to place, to drye and barren  
 " groundt, to make the same more fruitfull and profitablie,  
 " but alsoe to drawe water forth of and from all and all  
 " manner mynes, as well of tyne, lead, copper, coles, as  
 " all other mynes, pitts, or places whatsoever where water  
 " runneth or standeth, in hinderance of the getting thereof,  
 " by which said meanes the mynes, pitts, or places may be  
 " cleared of the said water with furre lesse danger and charge  
 " than the same nowe are, soe that much more tyne, copper,  
 " lead, coles, and other ores may hereafter be gotten with  
 " more ease than formerly they have bene."

[No Specification enrolled. Letters Patent printed, *id.*]

DIVISION I.—FIELD IMPLEMENTS.

A.D. 1627, August 6.—No. 39.

**BROUNCKER, WILLM, APRICE, JOHN, and PARHAM, WILLM.**—"A most readye and easy way for the earing, ploughing, and tilling of land of what kinde soever without the vse or helpe either of oxen or horses, by the labour or helpe of twoe men onely to goe with everie plough that shalbe vsed, with an engyne or gynn for that ppose."

[No Specification enrolled. Letters Patent printed, 4d.]

A.D. 1630, January 21.—No. 50.

**RAMSEY, DAVID.**—"To multiplie and make saltpetre in an open feldde in fower acres of ground sufficient to serve all our dominions; to raise water from lowe pitts by fire; to make any sort of mill to goe on standing waters by continual motion, without the helpe of winde, waite, or horse; to make all sorts of tapistrie without any weaving loome or way ever yet in vse in this kingdome; to make boates, shippes, and barges to goe against stronge winde and tyde; to make the earth fertile more than vsuall; to rayse water from low places and mynd and coalepitt by a new waie never yet in vse; to make hard iron soft, and likewise copper to bee tuffe and soft, which is not in vse within this kingdome, and to make yellow wax white varie speedily."

[No Specification enrolled. Letters Patent printed, 4d. See *Mechanics Magazine*, vol. 13, p. 66.]

A.D. 1634, January 29.—No. 68.

**RAMSEY, DAVID.**—"A farre more easie and better waye for sowing of corne and grayne, and allsoe for the carriage of coaches, cart, drayes, and other things goeing on wheelles, then ever yet was vsed and discovered." The patent relates also to "a newe waye of dyeing of woollen and linnen clothes, stuff, silkes, and other manufactures, in any kind of coloure, without the helpe or vse of cutchmell, that shallbe as pfecte, permanent, and lasting as any grayned coloure soe dyed with the said cutchmell, and that the said coloures and dyeing, by him and them soe invented as aforesaide, shall be pformed and done by the only vse of matterall naturally groweing and arising within our owne domynions."

[No Specification enrolled. Letters Patent and Surrender printed, 4d.]

A. D. 1634, July 17.—No. 72.

PARHAM, WILLIAM, PREWETT, JOHN, PREWETT, ARTHUR, and DORNEY, THOMAS.—“A certaine newe and readie way, for the good of our comon health, for the earinge and plowing of land of what kind soever, without the use or helpe of horses or oxen, by meanes of an engine, by them newly invented and framed, and not formerly practized or used within our kingdome of England or dominion of Wales, by the labour and strength of two men onlie to drive or inforce the saide engine, and of one other pson to hould or guide the plowe or sallowe to be drawne with the same engine.”

(No Specification enrolled. Letters Patent printed, 4d.)

A. D. 1636, July 5.—No. 95.

SHAWE, JOHN.—“Diverse wayes and meanes for the better manuring and ymproving of ground of all sort (not formerly found out nor practised by any.”

(No Specification enrolled. Letters Patent printed, 1s.)

A. D. 1637, May 17.—No. 105.

CHIVER, ROBERT.—“A newe and better waye of improvement of lande and course of husbandry than hath hyn formerly practised in anye of our kingdomes by raising of waters by severall hatches, bayes, engines, wheelles, mills, pamps, and other instrumente, and by altering the nature, quality, forme, and superficies of some grounde, and by enlarging of rivers and watercourses according as the situation of the places and occasions shall require, and by drayning and raising of lowe, wet, feney, moorish, and marsh grounde, and by lycing and marling of some grounde, and by veying of gravell, sand, rubbische, stones, and Hynte in some grounde, according to there severall natures and qualities, and by planting and producing greate increase of loppes, with muche saving of wood nowe used in poyling thereof, by making them growe, runne along, and beare upon ropes, or wreathes made of strawe, reedes, sedges, rushes, brushwood, or bryars, to reache from one hopfull to an other, the said ropes or wreathes being tyed



" vnto and soe supported only by one shorte pole of aboute  
 " eghte foote long, placed vpight in everie severall hoppill,  
 " or supported by one pole of fiftene foote long with pyms  
 " and crookes, and by artificiall engines or instrumente to be  
 " used for expedicion in making greate trenches to convey  
 " the waters to the grounde, and to raise and alter the forme  
 " and superficies of some grounde, and by planting of younge  
 " trees for the increase of tymeber in drye and barren grounde."

[No specification enrolled. Letters Patent printed, *id.*]

A. D. 1638, February 15.—No. 115.

WORSLEY, ORSELL.—" A newe waye of setting and planting  
 " of carrett roots and carrett seeds, by him devised and found  
 " out, by taking the roots itself out of the ground as soone as  
 " it comes to soone ripens, and then by planting of it againe "

[No specification enrolled.]

A. D. 1640, March 12.—No. 125.

CHIVER, ROBERT.—" A newe and better way of improvment of  
 " lande and course of husbandry then had beene formerly  
 " practised in way of our kingdomes by raisinge of waters by  
 " severall hatches, bayes, engines, wheelles, milles, pumpe,  
 " and other instrumente, and by alteringe the nature, quality,  
 " forme, and superficies of some grounde, and by enlarging  
 " of rivers and waterhouses, accordinge as the situation of  
 " the places and accusacions should require, and by drain-  
 " inge and raisinge of lowe, wett, fenney, moorish, and marsh  
 " grounde, and by lyminge and marling of some grounde,  
 " and by vseinge of gravell, sand, rubbish, stoues, and flinte  
 " in some grounds, according to their severall natures and  
 " qualities, and by plantinge and pducinge greate increase of  
 " heppes, with much savinge of wood now used in poleinge  
 " thereof, by makinge them growe, rime alonge, and beare  
 " upon ropes or wreathes made of strawe, reede, sedge,  
 " rushes, brushwood, or bryers, to reach from one hopp hill  
 " to another, the saide ropes or wreathes being tyed vnto and  
 " soe supported only by one shorte pole of about eight foote  
 " longe, placed vpight in every severall hopp hill, or support  
 " by one pole of fiftene foote longe, with pinnes and crookes,  
 " and by artificiall engines or instrumente, to bee used for

" expedición in makeinge greate trenches to convey the water  
 " to the ground, and to raise and alter the forme and superficies  
 " of some ground, and by plantinge of younge trees for the  
 " increase of tymer in dry and barren ground."

[No Specification enrolled. Letters Patent printed, 6d. No Drawings.]

A.D. 1666, May 16. —No. 150.

BAYLIE, LEWYS. — "A certeine machin or engine for the  
 " more expeditious cutting, digging, or making navigable  
 " rivers, draynes, lynes, or trenches, or for cleansing of any  
 " rivers racked vp or obstructed in their current."

[No Specification enrolled. Letters Patent printed, 6d.]

A.D. 1670, September 22. —No. 160.

SMITH, JAMES. — "Planting and making mather."

[No Specification enrolled. Sumet Bil printed, 4d. No Drawings.]

A.D. 1730, September 21. —No. 518.

STANYFORTH, DIXON, and FOLJAMBE, JOSEPH. — "A  
 " new sort of plough, by which the farmers may plough with  
 " greater ease, and with less charge than with the ploughs  
 " hitherto used; that the number of horses used at present to  
 " work the ploughs will be sufficient to work three of their  
 " ploughs, by which means three acres of ground instead of  
 " two acres may be ploughed at the same charge and within  
 " the same time." The beam of the plough is made by a  
 " mould, and the rear end of it is " mortessed into the land stilt  
 " or hane." The stuth, to which is fastened the upper part  
 " of the fore end of the land stilt, is also made by a mould, and  
 " is of peculiar shape, the hither end of it is " mortessed into  
 " the beam, and the fore edge thereof goes " forwarder than  
 " the fore edge of the shield board." The shield board, to  
 " the middle of which is fastened the furrow stilt, " is also made  
 " by a mould, and the fore edge thereof is " joynd to the  
 " furrow side of the stuth," whilst " the hither end is pinned to  
 " the furrow stilt or hane, and the said stuth and shield board  
 " being joynd as above make one entire shield board, and the  
 " furrow side of the plough." Two mould plates are " fas-  
 " tened upon the shield board, one upon the upper edge and

"the other upon the lower edge thereof." The heel of the plough is "fastened under the fore end of the land stilt or hane, the bottom of the said heel of the staith, and of the end of the land stilt which goes between the heel and the staith, answer to the bottom of the heads of the old ploughs, there being no head or neck to this plough." The shares, which are also made by a mould, are peculiar "both in shape and in their manner of fixing, the hane share being fixed to the staith and sheild board;" "the said share going on about six inches upon the staith, and the land hane lappa about two inches over the land side of the staith, and goes on about four inches and a halfe over the fore end of the sheild board, and the furrow hane lappa round till it comes within two inches under the sheild board breadth way. The sockett share is fixed upon the plough after the same manner, but lappa round the fore ends of the staith and sheild board, so far as it goes on." The coulter passes "through the beam nearer to the topp of the staith than in the old ploughs, and being fixed upright cutts a square keyfe." A bee "goes round the beam at the place where the coulter comes through, and if a horse plough, then instead of shackles there is an iron cock at the farr end of the beam." The invention includes "a share for paring of ground, which may on occasion be putt upon this plough."

[Printed, &c. No Drawings. See Ralls Chapel Reports, 6th Report, p. 119.]

A.D. 1742, April 10.—No. 583.

COGAN, WILLIAM.—"The use of a seed of the growth of this kingdom out of which an oyl may be expressed which will be of great benefit to his Majesty's subjects in general, but more particularly to house painters for all sorts of common painting work; and also of my new method of cultivating the vegetable which produces the said seed." The seed mentioned in the Letters Patent is "poppy seed of all sorts," and the "new method of cultivating the said vegetable which produces the said seed does consist and is to be performed in the manner following, (that is to say):—By mixing three pounds of the said seed with two bushells of the ashes of any other vegetables, and three bushells of the dust of poppy cakes, and three bushells of the dust of rape cakes,

" and four bushells of pidgeon's dung, for the sowing of one  
 " acre of land; and so in proportion for a greater or less  
 " quantity of land."

Printed, 4d. No Drawings. See Rolls Chapel Reports, 6th Report, p. 120.]

A.D. 1769, July 13.—No. 933.

MOORE, FRANCIS.—" Machines or engines, made partly of  
 " wood and partly of iron, brass, copper, or other metal, and  
 " constructed upon peculiar principles, capable of being  
 " wrought or put in motion by force or power, without being  
 " drawn by horses or any other beasts or cattle, and will be  
 " very useful in agriculture, carriage of persons and goods,  
 " and also in navigation, by causing ships, boats, barges, and  
 " other vessels, to move, sail, or proceed with more swiftness  
 " or dispatch than usual."

No Specification enrolled. See Mechanics' Magazine, vol. 16, p. 183.]

A.D. 1770, June 1.—No. 961

MOORE, FRANCIS.—" A new plough constructed upon peculiar  
 " principles, and capable of being wrought or put in motion  
 " with less force or power than usual." The improvement  
 " consists chiefly in the employment of two wheels, which take  
 " off a great amount of friction as the plough proceeds. The  
 " first wheel described is fixed perpendicularly in the body of  
 " the plough, and turns round in the furrow as the plough is  
 " drawn along, and prevents her from dragging as a sledge.  
 " One end of the axis of this wheel runs "in a box or collar next  
 " the mould board, and the other end under the barr or frame  
 " which is fixed to the breast or front of the plough at one  
 " end with a screw bolt, and to the back frame by another,  
 " which also helps to stiffen the plough." The mould  
 " board is "cut or sloped up from the breast," "to admit the  
 " weight or pressure of the plough to fall heavier on the per-  
 " pendicular wheel." The second wheel is situated at the  
 " heel or back frame of the plough in the furrow," and turns  
 " round horizontally against the land on the land side of the  
 " plough, and it may, with its axis or spindle, which goes through  
 " two boxes or collars affixed to the back frame of the plough, be  
 " taken up or let down at pleasure and fixed in the required  
 " place "by means of a screw; and, as the spindle frame and  
 " wheel all turn round together, the wheel is prevented from

"clogging or choking." When the earth is clammy, the plough scraper with the handle "may be drop'd through a "broad staple on the back frame to keep it tight and stand "about a quarter of an inch from off the periphery or outside "of the horizontal wheel to clear off the clay or earth." The principal parts of the plough are fastened together by means of screw bolts and nuts. The wilds or copps are fixed to the brace by a bolt or pin, on which they turn or swing, and so more or less land may be taken at pleasure. The plough may be made of any size, "and also, with a little variation, to cut "drains."

[Printed, &c. Drawing.]

A.D. 1776, July 6.—No. 1129.

DEARMAN, RICHARD.—"An intire new method of making "hoes for the American and West India plantations." "To "form the hoes, melt the iron in a furnace or crnoble, and "cast the same in moulds of a suitable shape and size; then "to give them a better body and bring them nearer the state "of maleculity, Neal them in a gradual heat till that be "effected, afterwards grind them to a proper edge, and harden "them. And in order to strengthen the eyes of such of them "as may be apprehended rather too weak, put a ferrule of "malicable iron round the same, that will enable them to bear "the hardest wedging that is requisite for fastening the "shaft."

[Printed, &c. No Drawings.]

A.D. 1777, February 20.—No. 1146.

HENRY, SOLOMON.—"A machine for watering roads, gardens, "and lands, on principles entirely new." "The said machine "is proposed to consist of a chamber for receiving water from "a conduit or pump, round, square, or any other shape, to "be made of copper, brass, tin, pewter, or any other metal or "mixtures of metals or other materials, to issue two or more "tubes of conic form, of any dimensions, for receiving water "from the chamber, with small holes to discharge and spread "the water, and cocks to stop the same when requisite; at the "bottom of which said chamber is to be a neck passing through "the carriage on which the chamber and tubes turn, to fix a "water pipe to, and for forming the water into the said chain-

"ber and tubes, which carriage is to be on wheels, and to be  
"drawn by a man or men, horse or horses."

(Printed, *et.* No Drawings. See Rolls Chapel Reports, 6th Report, p. 163.)

A.D. 1781, August 22.—No. 1305.

PROUD, THOMAS.—"The method of making a drill, to be  
"used by fixing it to the side of a common plow beam upon  
"an entire new construction calculated to sow turnip seed,  
"rape seed, and all kinds of corn, grain, and other seeds  
"whatsoever, by distributing the same in any quantity at any  
"distance required, and covering it at any depth that may be  
"thought necessary." The turnip drill consists principally of  
a drill frame, a wheel which runs along the ground, and a seed  
box, the roller of the seed box deriving its motion through the  
medium of a string which connects one of two pulleys on the  
wheel with one of two pulleys attached to the roller of the seed  
box, it being so arranged that "by varying the pulleys you  
"may plant at what distance you please." The drill frame is  
fixed to the plough beam by means of two screws in such a  
position that the drill box is "equal with the hind part of the  
"mould board," the drill box being fixed upon a slider at the  
end of the frame where a screw "serves to tighten the string,  
"likewise by lengthening or shortening the string makes it  
"plant the seed deeper or shallower;" and another screw "is  
"to set the drill according to the furrow you chose to plow."  
The axle tree of the wheel may be raised or lowered, according  
to the depth you wish to plough, by means of a screw. "In the  
"inside of the turnip drill box is a brass screw with hair in  
"the end like a brush which is to stand as close to the wheel  
"that takes out the turnip seed as possible but hardly to  
"touch." The corn drill, which is "fixed upon the same  
"frame and in the same manner, by means of a slide, has a  
"regulating screw which by turning to the right hand the  
"grain is dropt in larger quantities and the contrary in less  
"and by this method it is altered for different kind of grain."  
There is a spring having a string attached to it fixed to the  
side of this box, which string comes up to the plough handle,  
where a "slip is fixed to which the other end of the string is  
"fastened so when the string is tightened the seeds flows out  
"but when slipped it stops."

(Printed, *et.* Drawing.)



A.D. 1783, January 13.—No. 1349.

**COOKE, JAMES.**—The invention is described as "a machine  
" for ploughing or drilling land, and therein planting or sow-  
" ing all sorts of grain, pulse, and seeds, mixed with or with-  
" out pulverized manure, and harrowing the same," but no  
mode of ploughing is specified. A large wooden roller carries  
the machine, and upon its axis, which is made of iron, is a  
cast iron pinion wheel, which gears respectively with two iron  
wheels fixed upon the axis of a cylinder, upon which are set  
cups or ladles of different dimensions for different sorts of grain  
and seed, each cup containing two separate cavities at right  
angles to each other, which, being reversed, will take up  
proper quantities of grain or seed respectively. The seed box  
is in partitions, and is fixed over the roller "upon uprights in  
" the frame, with a slide, and staple, or screw at each end to  
" elevate or depress the same with smaller or secondary seed  
" boxes, to be placed occasionally within the others, for con-  
" taining small seeds." The funnels, which are made of tin,  
or other metal, and of different dimensions for different sorts  
of grain and seed, are "suspended by hooks put into holes in  
" the edge of the seed box to raise or depress the same." The  
coulters, which are made of cast or wrought iron, are fixed in  
mortices through the coulters beam by means of wedges. The  
harrow is made of cast or wrought iron, and they are "sus-  
" pended at the back edge of the coulters beam by means of  
" iron straps " going round, and "projecting a little from the  
" beam with chains and plates of iron to put upon hooks " in  
" a lever, " to raise or pull the same, so as to cover the grain,  
" seed, or manure taken up out of the curved part of the seed  
" box by the cups or ladles, and dropping from thence, as the  
" cylinder revolves, into the funnels, and conveyed thereby  
" into incisions made in the land by the coulters." The action  
of sowing is stopped by throwing the respective wheels on the  
ladle cylinder out of gear with the pinion wheel. The depth  
of the incisions made in the land by the coulters is regulated by  
suspending a proper weight, by means of hooks, to each end  
of a lever, which is applied horizontally to the outside of the  
frame. Wheels of the same diameter as the roller may occa-  
sionally supply its place with the same axis and pinion wheel.

[Printed, &amp;c. Drawing.]



A. D. 1783, May 3.—No. 1866.

**DRIVER, WILLIAM.**—"Method whereby to break up, raise, load, remove, carry, cast, shoot and otherwise work the mould, gravel, stones, chalk, and other materials and substances of the earth without the necessity of man at labor."

The drawings originally enrolled with this Specification, and alluded to in the description, have unfortunately been lost, and it is not therefore possible to decide with accuracy the exact nature of the invention. The following description must therefore be taken as the best that can be made from the materials still existing.

A three-wheeled carriage has mounted below it a plough share, and the earth as it is turned up is received in receptacles fixed to the periphery of a wheel by which it is delivered into a receptacle formed by the body of the cart. The plough is then detached and the earth, &c., transported to the place required, when the flaps of which the bottom of the cart is formed are allowed to fall down and discharge the contents. The apparatus may also have "two loading wheels and a double plowshare."

[Printed, &c. No Drawings.]

A. D. 1784, March 13.—No. 1424.

**HORN, JOHN.**—A new drill by which any description of seed may be sown broadcast over the ground as well as in furrows. "The machine may be made of different lengths. The number of hoppers and spouts depend on whatever length it is made, the spouts being placed about sixteen or eighteen inches asunder." The several spouts, which receive the seed from the hoppers above them, rest upon a bar; which is "hung upon two diagonal supporters of equal length" from a cross bar of the machine. The bar by its gravity bears by means of a trigger against a catch wheel, which is fixed on the axle of one of the wheels, and "occasions a regular motion, quicker or slower in proportion to the pace the person or horse mowing with it walks." The axle with the catch wheel is carried round by two triggers on the box in the nave of the wheel, which fit into an iron neck on the axle; the other wheel turns on the axle at liberty. In going on the side of a hill, the strength of the stroke received by the bar is corrected by

a spring fixed to a lever with a proper weight at the other end, and hung upon a pivot, this spring bears against the bar with more or less force, "in proportion as the machine is more or less from a horizontal situation." When it is required to sow corn or seed broadcast, an apron or shelf is placed in a sloping position at the bottom of the machine, so that the corn or seed, by falling thereon from the spouts, is distributed by the rebound; whilst a second moveable spout is made use of to sow the seed in drills or furrows. The action of the machine may be stopped by means of a lever, which, when moved from one channel to another, carries back the bar from the catch wheel, and "occasions the motions of the spouts to cease, and "at the same time brings them upon a level by the action of "the diagonal supporters." There is a bridge made of brass in each of the spouts with an aperture in it for the grain or seed to pass through; this is enlarged or contracted by a brass slide, which may be properly fixed, by a regulator used for the purpose, for the quantity of seed, where not less than one bushel is designed to be sown on an acre. When it is required to sow a smaller quantity of seed, viz., from one to three gallons, a second brass plate, having two apertures of different dimensions, is placed between the bridge and the slider with the larger aperture downwards; and, to sow a still smaller quantity of seed, the same plate is placed between the bridge and the slider with the smaller aperture downwards.

[Printed, 10d. Drawing. See Rolls Chapel Reports 5th Report, p. 143.]

A.D. 1784, July 30.—No. 1446.

WRIGHT, JERVAS.—"A machine upon an entire new principle for sowing wheat, beans, peas, and other grain "and seed, which might be affixed to a plough or other-  
"wise." A seed plate, placed between the bottom of the seed hopper and the top of a lower box or case, receives horizontal motion by being placed upon the square part of an upright spindle, carrying a pinion to which motion is communicated from the axis of a wheel revolving upon the ground, which pinion can be thrown in and out of gear at will, and the action of the seed sowing apparatus thereby stopped during the progress of the machine. In the bottom of the seed hopper is a semi-circular opening, part of which is occupied by brushes

or bristle bars, standing perpendicularly to the horizontal seed plate, whilst the other part forms an opening through which the seed descends into open channels of the seed plate, whence by the rotation of the plate the seed is forced by divisions in the plate under the bristle bar, and dropping through an opening in the brass table forming the top of the lower box is thence conducted through a perpendicular pipe into an oblique pipe that deposits it on the ground, which oblique pipe is placed on a round iron rod or swivel fixed on the fore part of the lower box, and may be turned to the right or left under the bottom of the machine. The iron axis of the before-mentioned running wheel has an universal joint therein, and passes through a block of wood, forming the basis or foundation of the machine, to which block is fixed an iron frame or segment of a circle, within which a roller placed upon a round part of the axis plays up and down, and enables the wheel to get over obstructions, and at the same time prevents it from turning sideways. On this combination of "the roller" "and universal joint," together "with the horizontal movements of the seed plate as applied to the purpose of this machine," the patentee observes, "I principally build my claim of right and property to this invention."

[Printed, &c/ Drawing. See Repository of Arts, vol. 15, p. 569.]

A.D. 1785, January 28.—No. 1461.

VAN THORNHOFF, RAYMOND. — (*A communication.*) — A hand digging machine, which consists of a frame, two iron spades, a wooden middle piece containing an iron axis, upon which the helvæ of the spades turn, and a cart which serves to advance the machine, and consists of a beam, an axis, and two wheels. The digging machine is used in the following ways:—"The digger draws it near the ground which he intends to dig up, and then, standing with his back towards the said ground, lifts the machine up, and presents the edges of the spades within six inches of the ground to its surface as perpendicular as possible. In this situation he treads with his right foot upon the middle piece," "driving the spades into the earth; then he shakes the frame of the helvæ with both hands, in order to separate the ground a little from the spades; this being done, he pulls the said frame with a little more elastic movement

"towards himself, which loosens the ground; and finally a third still more elastic and strong shake, given with his body bending forward, will throw the ground over, smoothen and level it; after which the digger goes one step backward, and advancing the machine ten inches more inside the ground, continues his labour." The machine is ordinarily constructed to dig the ground to the depth of twelve inches, but it can be made to dig only to the depth of six inches by screwing an additional wooden piece provided for the purpose underneath the above-mentioned middle piece.

[Printed & Drawing.]

A. D. 1785, March 18.—No. 1468.

RANSOME, ROBERT.—"New-invented art of making plough-shares of cast iron, which is tempered after a peculiar manner so as to stand the strictest proof."

The "ploughshares are moulded in flasks of sand, and the pattern being taken out of the flask, leaving a fair cavity of the form of the share, these parts of the sand coming in contact with the cutting edge of the share are wetted by means of sponge steeped in water saturated with common sea salt, which gives the edge its proper temper. When this operation is over the mould is finished, and then, closing the flasks, the metal, being brought into fusion, is poured into the mould, and the share is completed."

[Printed, &c. No Drawings. See Rolls Chapel Reports, 6th Report, p. 176.]

A. D. 1785, October 20.—No. 1498.

HORN, JOHN.—A sowing machine, the upper part of which contains hoppers, whence the corn or seed descends into spouts which rest upon a bar, hung upon another bar, so as to play freely, by two diagonal supporters, whilst the further end of the spouts, and a lever (for preventing the machine from sowing) rest upon another bar at the back of the machine, the bar with spouts upon it having a regular or jogging motion communicated to it, when the machine is driven forwards, by means of stays, two of which are placed from this bar to the bar at the back part of the machine, which stays play upon pins at each extremity, and bear, by their gravity, and by a trigger upon them, against a catch wheel, fixed upon the revolving axle of the running wheels; the strength of the stroke

received by the bar from the catch wheel, when the machine is drawn over unlevel ground, being corrected by a spring, fixed to a weighted lever, which spring presses against an iron plate at the bottom of the bar "with more or less force according 'as the machine is more or less from a perpendicular position," and causes the bar to press with a proper degree of force against the catch wheel; by these means the spouts feed in proportion to the space the machine passes over, and the corn or seed, falling upon an apron or shelf, placed in a sloping position at the bottom of the machine, is distributed broadcast over the ground; or, the seed may be drilled in furrows, by being caused to pass from the upper spouts through moveable spouts, which direct it to the centre of each plough furrow. The axle of the wheels passes through cylindrical boxes, on which, between upright pieces, move contrivances, with rods at the ends of the shafts, whereby the shafts may be taken off; on the cylindrical boxes also move handles at the back part of the machine. The upper spouts, each of which may be taken up separately from the bar, and thereby prevented from feeding, have a brass bridge, with an aperture therein, for the grain or seed to pass through, fixed in each, which aperture is enlarged or contracted by a brass slider, which is properly placed by a regulator, whereon the quantity of grain or seed to be sown on an acre is designated. In sowing small seeds, a brass plate, having apertures therein, is placed between the bridge and the slider, and, according to the dimensions of the aperture used, so will the quantity of seed sown on an acre be varied. When the machine is made to be used by hand, the shafts are omitted, and it is driven by handles, to which a leg is added for the purpose of resting the machine.

A machine similarly constructed, and capable of being fixed to a turn-wrest plough, is described, wherein the axle with the catch wheel is put in motion by a strap connecting a pulley on the axle with another pulley on the axle of a wheel which runs along the ground at the heel of the plough.

[Printed to Drawings.]

A. D 1786, October 18. — No. 1503.

WINTER, GEORGE. — Machine for depositing or drilling seed. *Standards on the side frames are made "with removable rings" at top for hitching chains to draw the machine.* The fore-

wheel has brass or iron gudgeons on its axle, "which are  
" placed in brass or iron plates, containing six or more holes,  
" each with jointed plates to turn up against the holes which  
" contain and keep the gudgeons steady, which are to be  
" removed higher or lower; and folding or jointed plates  
" are to be secured with hooks and eyes." The coulters bars  
are secured on the frame, and each bar may be "made without  
" or with a hollow groove in the middle or any part thereof  
" for the bolts," screws, or wedges, used for the purpose of  
supporting the coulters, such groove or hollow being also for  
the purpose of removing the coulters to any required distance  
apart, and for raising them higher or lower. The coulters  
are made of iron, "with a groove (for conveying the seeds,  
" grain, or pulse out of the conductors into the ground.")  
Two or more standards on the frame are "to have grooves for  
" containing or fixing in a collar, for the purpose of supporting  
" the axle" of the hind wheels; which axle "contains several  
" holes for screws to enter for the purpose of fastening on  
" the cylinders with plates of iron in the form of L." Each  
hind wheel contains eighteen spikes, "which spikes are fixed  
" in the fellys and iron plates surrounding the wheels for  
" the purpose of making the wheels turn in the roughest  
" ground." The cylinders are made of brass and wood,  
" each containing nineteen cavities for grain, and thirty-eight  
" cavities for pulse and small seeds deposited with pulverized  
" manure. The cavities are in the form of a niche, which  
" terminates in a cone at the top, and is rounder or deeper  
" at the lower part, which is cut perpendicular." In the  
cylinders are cut grooves; or, in lieu of grooves, beads are  
made on them, for the purpose, in either case, of fitting the  
bottoms of the seed boxes on them, and to keep them steady.  
" The sliders are made of wood, with brushes at the ends to  
" fit the bottom parts of the seed boxes; and cylinders,"  
" with screws and horn nuts, for the purpose of raising or  
" depressing, and thereby regulating the brushes over the  
" cavities of the cylinders." The standards and works within  
them are enclosed with boards and a cover in the form of a  
large box. Attached to the back part of the frame are two  
handles, or a cross bar, for the purpose of lifting up the  
machine. One or more cross bars (similar to the coulters bars  
before described) are to be fixed at the back part of the



machine, for the purpose of having affixed thereto "large teeth or harrows, which are made to be raised or lowered "as required." Two temporary wheels may be affixed occasionally to the back part of the side frames, for the purpose of conveying the machine from one place to another. "The machine, and its dimensions of every part and parts, "to be made smaller or larger, and with such materials as "may be required."

[Printed, 6d No Drawings. See Rolls Chapel Reports, 6th Report, p. 173.]

A.D. 1797, March 10.—No. 1593.

HEATON, RICHARD. — A drill harrow for sowing different kinds of grain, seed, and manure. The lower part of the machine is a common harrow that runs upon three wheels, two which support the harrow, and give motion to the whole machine, and a third supports its fore end. Upon the iron axle of the two wheels is fixed a pulley, cog, or spike wheel, by means of which motion is communicated to the drill machinery. The spike wheel (when used) works in a chain, and gives motion to a roller "which sows the manure, the open links "each fitting on to a spike." "If the pulleys be used, "they work in a chain, belt, or string," and the axle on which the upper pulley is fixed rests upon a spring to keep the chain tight. To both the seed box and the manure box are fastened iron or steel plates, which rest upon racket wheels at each end of the axle of the seed wheels, and the roller of the manure box respectively; the object being to give a trembling motion to both boxes, and thereby bring the seed and manure down to the seed wheels and roller. The manure, when brought out of the box by the roller, "may either be conveyed "by proper funnels into the drill with the corn," or be sowed broadcast. More or less manure may be sown by raising or lowering a board above the roller, and this can be done as the machine is drawn along by means of screws and a handle. The wheels which deliver the seed turn all "upon one axis, "and may be removed nearer or further from each other, "as the distance of the rows requires. A greater or less number "may be put on at pleasure." The seed wheels are supply'd with seed from the upper part of the box through holes in a moveable board; "the holes are perforat'd with moveable



"petitions; and the board may be changed for one nearer or farther according to the distance of the rows." There is a water level attached to the seed box, and there are handles provided, by means of which the box may be kept in the same situation in going up and down hill, and thus an even quantity of seed may be sown. "A different kind of seed box" may be used, "which sows nearly as well as the other already described. It is nearly the same as the manure box, the roller being different, the one having holes to bring out the corn, and the other inches to bring out the manure. There is the addition of a brush," "which prevents the corn from being bruised. It sows more or less by altering the pulleys and chaps," and raising or lowering the brush. "Both the roller and box shakes; the seed may be conveyed by proper funnels into drills or not catch'd for broad cast."

(Printed, &c. Drawing. See Rolls Chapel Reports, 6th Report, p. 177.)

A.D. 1787, July 3.—No. 1614.

**WRIGHT, JOHN.**—"A drill plough." "It is moved upon and by two wheels that are fixed upon an iron axle which gives motion to the work. On this axle are fixed ribbed rollers that take out the manure which is conveyed into the drills. Before the above axle is also an axle with a number of rollers fixed thereto, that take out the seed which is conveyed into the drills that are opened by coulters fixed under the seed rollers to let the seed and manure into the earth. To these rollers are regulating slides that regulate the quantity of seed. Before these rollers are stop slides which slide on the top of the seed rollers, and prevent the seed from passing, so that there may be one or more rows sown at once. Behind the manure axle and rollers is an axle with rollers which deliver the small seeds into the drills. There works above the manure axle two iron bars, which break and separate the manure, and make it deliver more regularly. The quantity of small seeds and manure are regulated with movable slides in the same manner as the grain. To each set of rollers is a hopper fixed above, into which the grain seeds and manure are put. There is a harrow fixt to the machine which follows it, and covers the grain, seeds, and manure immediately after they are sown."

(Printed, &c. Drawing. See Rolls Chapel Reports, 6th Report, p. 178.)

A. D. 1788, June 30.—No. 1657.

SANDILANDS, ROBERT.—A "sward cutter." To a square frame, placed on two wheels, which support the hind part of the machine, "are fixed, for a double-horse sward cutter, " three shafts, as in a waggon." An "iron bolt " goes " through two pieces of wood or iron, seven inches long clear " of the wood, supported by iron stays fixed to the frame," and through "six strong pieces of wood called bulls," into which "are fixed the cutting wheels, which are iron, thirteen " inches diameter, three-fourths of an inch thick at the centre, " about an inch diameter, for piercing holes to fix the iron " axism; from that they are to be of such thickness as to " allow the edges to be well steeled. These wheels are fixed " by two bolts going through the bulls, with eyes at one end " for the axes of the wheels to run in, and nuts and screws on " the other," "and sunk in the bulls to prevent their inter- " fering with the weights," which are freestone, and rest upon the " bulls," all of them "having two holes in them, through " which iron spikes firmly fixed in the butts pass, in order to " keep them steady." The " bulls " are kept at their proper distance apart by means of "hollow pieces of wood, called " thories, three and one half inches long, which inclose the " bolt." "They are in two pieces, and bound together and " joined by a strap of leather or cord." To "a cylinder or " segment of wood, called a rocking tree, which goes across " the frame, and moves on the pivots fixed into it, one at each " end, supported by an iron bolt eight inches high," "six " chains are fixed by hooks, and are joined to the end of each " bull in which the cutting wheels run, so that when the rock- " ing tree is turned about " by the aid of a " lever fixed in the " middle of it, all the bulls, with their cutting wheels, are " raised out of the ground at once." The bolt which supports the bulls is further strengthened by "a small bolt of iron, " with a hook on the end," "to be hooked to the centre of it, " and joined to the frame by a nut and screw." "The " grooves in which the cutting wheels run may be covered " below at the hinder part with a plate of thin black iron," " having a slit in it where the wheels run, 'to prevent any rubbish from filling the grooves and clogging the wheels.

(*Antient, &c. Drawing.*)

A. D. 1788, August 12.—No. 1659.

COOK, JAMES.—“Improvements on a machine formerly invented by me for ploughing and drilling land and therein planting or sowing all sorts of grain, pulse, and seeds, mixed with or without pulverised manure, and harrowing the same.” A wheeled frame has mounted behind it a transverse bar, fitted by arms to the axle tree, so as to be capable of rising and falling within limits regulated by a chain. To this bar coulterns are attached, and to each coulter there is a corresponding funnel to guide seed from a box above to the furrow. This seed box has a rotating shaft within it, with series of cups thereon. These deliver the seed, manure, &c., through openings that may be closed by slides to the funnels. The coulter bar has affixed to it the handles by which the implement is guided. Behind the coulterns a harrow is attached, and thus has movement given it from a “tapet” on the main axle. A “hoe” plough may be substituted for each coulter on the coulter beam. This is formed of two inclined shares joined in front with a sloping edge. These are fitted to the base of a vertical stem. This implement may also be fitted separately to a plough body and used as a plough. A smaller implement is also figured like the one first described, but with a single wheel only in front which drives the spindle of the seed box by an endless band. For distributing seed also a triangular hopper may be used, with a rib along its lower edge in which a fluted roller revolves. A lever handle is affixed to the harrow, by which it can be raised from the ground when the machine is being turned. By detaching the harrow and seed box, the machine can be used for horse-hoeing. The harrow also can be used alone.

[Printed, &c. Drawing.]

A. D. 1788, October 29.—No. 1672.

HELE, WILLIAM.—“A drill machine for sowing grain or any kind of seeds.” On an axle in the middle of a frame are five wheels, three of them to take up the seeds from the seed box in buckets of different sizes, according to the seeds intended to be sown, and drop them into the funnels, the other two of different sizes to be used with a chain, which communicates with two wheels of different sizes on the axle of

a great wheel fixed in the fore part of the frame. The motion, which is given to the machine by the great wheel being drawn forward, may be thus increased or decreased by occasionally shifting the chain from one of the wheels on the axle of the great wheel to one of those on the axle in the middle of the frame. The "seed hopper" has "four spouts, on which are "sliders occasionally shifted to sow more or less," by admitting more or less seed to pass into the "seed box," which is "divided into three parts, with three funnels, on which are "three crooked spouts, occasionally shifted to drop the seeds "into the ground at any distance required." Over the seed box is a "wicker-work frame," "on which a canvass is occasionally fixed to sow in rain or wind."

[Printed, 6d. Drawing. See Rolls Chapel Reports, 6th Report, p. 179.]

A. D. 1789, June 20.—No. 1688.

RIDGE, SAMUEL.—"A drill and hoe plough on a new construction." This machine is carried by two wheels, whereof the axletree is extended through the naves in order to allow of the wheels being fixed at any convenient distance from the machine, and is so attached to the frame as to allow of the axletree being raised or lowered, for the purpose of regulating the depth to which the machine shall work in the ground. One of the running wheels has the inside of the nave made to correspond with ledges or bars on the outside of a long cylindrical box of iron, smooth on the inside to turn on the axle; which box also carries a groove wheel, connected by a line or chain to another groove wheel, the spindle whereof is made square at the end to carry also a pinion-wheel, which gears and gives motion to a cog-wheel on the square axis of the seed wheels; the pinion is kept in its place on the spindle by a spiral spring, and a mechanical contrivance is described whereby the pinion may, by means of a handle or wheel on the handle of the machine, be drawn out of gear with the cog-wheel on the axle of the seed-wheels, and the sowing thereby caused to cease; the spiral spring serving to force the pinion back again into gear. Over each of the seed wheels are placed two hair brushes—one in an oblique, and the other in a perpendicular position to the wheel—one of which brushes can be *adjusted so as to regulate the quantity of seed to be sown; a*

piece of tin may be also used as a slide, whereby the corn can be stopped in its descent from the hopper to the seed wheel, and any one seed-box or boxes thereby caused to cease sowing. The machine may be used either with or without a harrow, and also with or without shafts.

[Printed *int.* Drawing.]

A.D. 1789, August 27.—No. 1698.

BOORN, Moses.—“Engine for sowing all sorts of corn and grain in drills or rows.”

The drawings originally attached to the Specification have unfortunately been lost, and the description as it remains is quite unintelligible without them. It refers to a machine for drilling seed in which the seed is delivered from a receptacle by rotating cups to tubes which convey it to the drills. The body of the apparatus is adjustable, and the drill-tubes are removeable. The tubes are fitted with springs and slides to regulate the descent of the seed. Harrows are fixed behind the apparatus to complete the operation.

[Printed, *ad.* No Drawings. See Rolls Chapel Reports, 6th Report, p. 180.]

A.D. 1790, August 19.—No. 1773.

PERKINS, CHRISTOPHER.—“A drill machine for sowing corn, pulse, and seeds.” Three or more receivers, “properly adapted so as to receive pulse, grain, and seeds in suitable quantities, and of every denomination,” are attached to each machine; such receivers deriving their motion, through the medium of notched wheels, from the ground wheel. “These receivers are three inches in diameter, extending from side to side of the machine, and entirely suspended on their own centers, being totally unconnected with any other things,” save one of the notched wheels named above, “and which notched wheel is capable of being removed at pleasure.” “The coulters,” to which the seed is conducted from the receivers, “are made of malleable iron, and form a hollow square as far as the projection towards the bottom, where they are open at the back.” The ground wheel revolves on a fixed axis, which is secured at each end “by a screw bolt and nut; but previous to the axis being fixed, two iron bolts, made with circular eyes for that purpose, are put on to the

“ axis, one at each end, and to those bolts are applied the  
 “ shafts, which are fastened to the bolts by means of screw  
 “ nuts, and being so applied, the draught on no ground or  
 “ situation can possibly have any tendency to raise or depress  
 “ the coulters.” The box containing the seed is hung on slip  
 hinges, and can be secured at any required distance from the  
 receiver—“ this distance to be regulated by the size of the seed  
 “ in use, and just so high that such seed shall not pass but  
 “ when taken into the indented parts made in the receiver for  
 “ that purpose”—by means of iron plates, one of which is  
 applied to each end of the box, and thumb screws; each screw,  
 when in its proper position, being prevented from taking a  
 retrograde motion, by means of a spring. A slide or stop is  
 applied to each seed box, by means of which each box may be  
 stopped and opened again at pleasure.

[Printed, &c. Drawing.]

A.D. 1791, August 16.—No. 1824.

MERRICKS, THOMAS.—“ Improvements in the construction  
 “ of ploughs.”

First, “ those parts of the plough which are most subject to  
 “ wear are to be made of cast iron which is not only much  
 “ cheaper but will be found more durable than wrought iron  
 “ and steel which is at present used.”

Second, “ the iron work of the plough is to be made in  
 “ detached pieces instead of one solid piece by which means  
 “ those parts which are subject to wear and in daily want of  
 “ reparation can be readily and expeditiously separated from  
 “ the plough and supplied with others, by which means the  
 “ necessity of conveying the whole plough to a smith's forge,  
 “ and the loss thereby of a very considerable portion of time  
 “ is entirely obviated, as any person possessing himself of  
 “ several of the detached pieces may continue his work almost  
 “ without intermission. Several forms or shapes of these  
 “ detached pieces and the manner of fixing the same by mor-  
 tise and tenon pins or screws are here described, but the  
 “ same general principle will admit of great variety both in  
 “ form and mode of fixation.”

[Printed, &c. Drawing.]



A.D. 1791, December 17.—No. 1843.

HILL, ABRAHAM.—“ Making scythes with steel blades and  
“ iron or steel backs fixed on with screws or pins.”

The following is the whole Specification :—“ Take a piece of  
“ steel, forge and roll it to a proper thickness for a scythe  
“ blade, then cut it with a chisel or shears into the form of  
“ the scythe blade ; then punch or bore the holes for the pur-  
“ pose of fixing on the back ; then harden it by making it red  
“ hot in a furnace, and then putting it into a liquid or compo-  
“ sition to be made of oil, commonly called pale or sweet oil,  
“ resin and tallow, which liquid or composition is made as  
“ follows. Take twenty-eight pounds weight of resin, fifty-  
“ six pounds weight of tallow, and eight gallons of oil, which  
“ mix and boil together, then temper the blade by heating  
“ it over a fire till it becomes nearly the colour of a dark  
“ yellow, and when cold, set and grind it, and then fix  
“ on the back with screws or pins, which back is to be made  
“ of iron or steel, and the holes to be punched or bored.”

[Printed, ed. No Drawings. See Rolls Chapel Reports, 6th Report, p. 186.]

A.D. 1792, April 26.—No. 1873.

SMART, JAMES.—This invention relates to a mode of making  
a plough share and share bed. The share bed, which is to be  
fixed on the chip or shent of the wood frame of the plough by  
means of bolts, is formed into an open groove, in order to  
receive and fix the shank of the share, by means of projecting  
tongues, one of which is formed on the inside face of the top  
edge of the share bed, and the other on the bottom edge ;  
which “ bottom tongue or shoe part of the bed may be made  
“ narrower or wider according to the nature or quality of the  
“ ground in which it is to be used.” “ A hole or notch ” may  
be formed “ in the face of the share bed to receive a strip or  
“ piece of iron which ties or fixes the bottom frame of the  
“ plough to the main beam, but such share bed may be made  
“ without a hole or notch.”

The plough share may be made either with or without a  
nose, and is hollow underneath. It is securely fixed in the  
share bed by means of an iron wedge driven between the shank  
of the share and the projecting tongue on the top edge of the  
share bed, and has an iron hook or tuck fixed into its shoulder  
to hold the share up to the main beam of the plough. “ The



"several articles of this invention may be made in cast or wrought iron or steel, or any other hard metal."

[Printed, &c. Drawing. See Rolls Chapel Reports, 6th Report, p. 150.]

A. D. 1793, December 9.—No. 1969.

**CLIFFE, WASTEL.**—"A method of making plane irons, and making and fastening to proper handles hoes and all sorts of trowels, from rolled steel."

"First, take a piece of steel and roll it to the proper thickness of a trowel plate, then cut it with a chisel or shears into the form of a trowel; then punch, or drill and countersink one or more holes to fix on the tang; then harden it by making it red hot in a furnace, and putting it into a liquid or composition to be made of oil (commonly called sweet or pale oil), rosin, and tallow, which liquid or composition make as follows.—Take twenty-eight pounds weight of rosin, fifty-six pounds weight of tallow, and eight gallons of oil, which mix and boil together; then temper the plate by heating it over a fire till it becomes nearly the colour of a dark yellow and then fix on the tang with screws, or pins, or dovetails, which tang is to be forged of iron or steel, to be punched or drilled for the pins or screws, and stamped for the raising of the dovetails for brisk and pointed trowels. And for the plastering trowels the tangs are to be forged, or rolled or stamp'd, to raise one or more dovetails, which are to be used only to fasten the handle to the plate, and then to be set and ground."

"The hoes are made on the same principles as the trowels; and the Specification of the plane irons is as follows:—Take a piece of steel rolled in a twilled or taper form, then cut it with a chisel, or stamp, or shears, into the shape of a plane iron, and harden and temper it after the same manner as the trowels and hoes, in a similar liquid or composition."

[Printed, &c. No Drawings.]

A. D. 1795, January 19.—No. 2033.

**WILDE, ARNOLD.**—Scythes, sickles, and other tools.

Molten steel is poured into a mould in which is previously placed a piece of wrought iron, in such a position that it may occupy any required place in the finished article. The scythe, &c., is then made in the usual way.

[Printed, &c. No Drawings. See Repository of Arts, vol. 2, p. 360; Rolls Chapel Reports, 6th Report, p. 150.]

A.D. 1796, February 27.—No. 2092.

CLAY, HENRY.—“A carriage or machine for the conveyance  
“ of and for the shooting and discharging thereof coals, lime,  
“ soil, manure, stones, gravel, sand, rubbish, and other  
“ materials.”

Two “separate and distinct bodies” are supported by a frame, which is fixed on two carriages supported by four wheels  
“ These bodies act or turn separately on axles that are placed  
“ on the said frame, and at a certain distance from the wheel  
“ axle for the fore body” “to clear any part of the fore  
“ carriage in shooting or discharging the loading, which will  
“ fall between the frame and fore and hind wheels. The  
“ supporters for the hind part of the bodies turn on a pin.”  
The load of the hind body “must be discharged first, and will  
“ fall between the hind part of the frame;” the fore body  
after discharging its load will return first to its former situation. “Two cross bars” “prevent the body’s falling further  
“ than necessary.”

[Printed, 16d. Drawing. See Rolls Chapel Reports, 6th Report, p. 146.]

A.D. 1797, October 19.—No. 2195.

WATTS, HARRY.—“Implement for draining land.”

A drain-plough is described. It has a long vertical coulter carrying a share. In front of this is a revolving cutter, which is moveable, and may be replaced by a fixed cutter, or entirely dispensed with, a plate being fixed over the opening in which it is fitted. The beam is horizontal, and supported by a small roller in front. Stilts of the usual sort are fitted behind. The plough is used by being started from a hand-made trench, into which all the drains cut by it run.

[Printed, 6d. Drawing. See Repository of Arts, vol. 8, pp. 225 and 317; Gentleman’s Magazine, vol. 68, p. 96.]

A.D. 1798, March 10.—No. 2223.

LESTER, WILLIAM.—“A harrow upon a new and improved  
“ construction.” “This Specification consists of two opposite  
“ principles to the common harrow, first, the tires stand at  
“ double the distance of the tires in the common harrow,  
“ second, in their line of draught they hook above as near  
“ again as the tires of the common harrow.”

[Printed, 4d. Drawing.]

"The above machines or instruments may be made of any proper materials, on a larger or smaller scale, and may contain more or less of the instruments" or tines as may be convenient.

[Printed, *ed.* Drawing. See Repertory of Arts, vol. 12, p. 21.]

A. D. 1799, July 4.—No. 2324.

BOYCE, JOSEPH.—"Machine for cutting of wheat and all other corn."

A series of horizontal curved knives are fitted radially on a vertical spindle affixed to the body of a cart, and revolved by toothed gearing from the axle of the supporting wheels. There is a guard "fixed over the knives which is made to extend or contract occasionally, and is shaped so as to guide the corn to the knives, and to lay it smooth against the standing corn. By means of a collar on the nave of the wheel and a pin, the wheel and the axle-tree may be locked together when it is required to impart motion to the apparatus. The collar carrying the knives slides on the spindle, so that it can be set at different heights.

[Printed *ed.* Drawing. See London's Encyclopædia of Agriculture, vol. 1, p. 422, Rods Chapel Reports, 6th Report, p. 196.]

A. D. 1800, February 4.—No. 2373.

LUMBERT, RICHARD.—"Various additions to and improvements of the plough or machine for the draining of lands, by means whereof the many disadvantages attending the ploughs or machines heretofore used are obviated in a very simple and perfect manner." The machine may either be worked by manual labour, by means of an anchor, rope or chain, and a windlass, or drawn through the ground by horses. The handles move "on a pin or centre which, passes through the beam at their extremity," "so that they can be made to turn over on the beam," or move up or down at pleasure, and be kept in the required position by means of an iron pin across the handles striking into notches in an iron catch or lock attached to the base or circular end of the beam. The beam is kept in its required position by means of two rollers contained in frames, one fixed at its base and the other at its fore-end. Through mortises in the beam are fixed two coulters by means of wedges, and an iron pin "which screws into an iron plate and

"acts against the coulters by pressure." To the hinder or back coulters is attached the cone or share, made of steel, cast iron or wrought iron, the dimensions of which at its base end may be increased "by means of separate cones or balls chained "or connected together, and gradually increasing in size;" to the front end of the cone is attached a moveable steel point having "a shoulder and joint fitting in and upon the socket of "the fixed part of the cone;" to such point is given a rotary motion on its axis, as the machine is drawn forward either by a spiral worm upon its sides or by the coulters being made hollow and containing an iron rod, through which motion is communicated by means of wheels and pinions from a travelling wheel. Several cones, one above the other, may if required be attached to the same back-coulter. The windlass with its frame may either be fixed to the beam of the machine or be entirely detached. "The draft chains" are fixed to a hook "in the middle of the beam at the base end, and connected to "two iron bars passing through rings in the axis of the "front "roller." "The point of traction or draft, together "with the elevation of the beam of the plough or machine, "with the co-operation of the rollers "entirely prevent the "share or cone from acting otherwise than in a line parallel "to the surface of the land."

(Printed, &c. Drawing.)

A.D. 1800, April 26.—No. 2391.

RICHARDS, JAMES. —"A machine or machines for setting or "depositing in the ground grain and seeds." Rotary motion is communicated to dividing rollers by means of an endless chain, connecting a pulley on their axis with another pulley on the axis of two iron "beveled cutting wheels," which as the machine is drawn along the ground make furrows for the deposition of the seed. The feeders which contain the grain or seed have their fore parts resting upon pinion cog-wheels, the axis of which derives motion through gear-work from the axis of the dividing rollers, whereby a shaking motion is given to the feeders, and the grain or seed is thereby brought down channels or grooves to holes in the dividing rollers, whence owing to the revolution of the rollers, it passes from each roller down a channel or groove at the back of a wrought or cast-iron share, which follows each cutting wheel for the pur-

pose of keeping open the furrows. The pinion cog-wheels with their axis as well as the hind part of the feeders are supported on cranks connected with a regulator, the axis of which is exactly over the centre of the dividing rollers. Crank wheels are provided for the purpose of raising the cutting wheels and shares out of the ground in turning the machine. The machine may be made without the dividing rollers and segments of a circle when it is required that the grain or seed should be deposited near together; "with this variation the fore part of each feeder is placed straight to the upper part of the groove at the back of each share, and rests on the pinion cog-wheels to give them a shaking motion as before mentioned, which wheels act in the frame instead of being attached to the regulator, and receive their rotary motion by a chain from the cutting bevelled wheels." Horizontal dividing wheels, having holes through them near the edge, and fixed rims to prevent the grain or seed from falling off, may be used for dividing the seed; in which case fixed circular plates confine the seed in the holes until it comes to other holes, whence it drops down the grooves behind the shares.

[Printed, 19d. Drawing.]

A.D. 1800, May 20.—No. 2404

MEARES, ROBERT. — "Machine for cutting, after a new method, standing corn, grass, and the like, and for making reed."

A large pair of shears is fitted to a frame mounted on wheels. Long handles are fitted to the shears, and by these the apparatus is propelled and the shears are operated at the same time. Wires are arranged to guide the fall of the crop as it is cut. A pole may be attached by which the apparatus may be moved, the handles of the shears being thus employed for cutting only. "For making reed the wheat is placed with the ears downwards, one person to cut and two or three to feed."

[Printed, 4d. No Drawings. See Rolls Chapel Reports, 5th Report, p. 119.]

A.D. 1800, October 18.—No. 2449.

PLENTY, WILLIAM. — "A pump and a plough upon a new or improved construction." "The plough consists of a stock or body of iron, to which is fixed in grooves by means of

" screw bolts and nuts, a beam, share, coulter, turnfurrow,  
 " and shoe. A handle on the left hand is likewise fixed in a  
 " groove to the stock, and the right handle to the beam by  
 " screw bolts. A fore carriage, consisting of an axis, bed,  
 " axle, two wheels, a swivel regulator, an upright collar, and  
 " a pin and chain, is connected with the body by means of a  
 " draw chain. The beam passes through the upright collar,  
 " and is raised or lowered by lengthening or shortening the  
 " draw chain, so as to give the plough a shallower or deeper  
 " direction. The regulator is a tube with a shoulder, which  
 " passes through a plate of iron fixed on the axis bed and the  
 " stem of the collar, through the tube, which is raised or  
 " lowered by the pin, and prevents the plough oscillating  
 " when turning on rough ground. The beam handles and  
 " axis bed are of wood. The facility with which the plough  
 " is worked is a saving of one horse in four. The pump is  
 " made of six or more angular pieces of wood, bound together  
 " by iron hoops, and form one or more chambers or barrels to  
 " receive as many boxes and buckets, or two buckets in one  
 " barrel if required, the whole to be worked by an indented  
 " wheel fixed in a frame by one or more evers."

[Printed, &c. Drawing.]

A. D. 1801, February 17.—No. 2479.

WILDE, WILLIAM.—"Some improved machinery or apparatus  
 " to be attached or annexed to harrows." Shafts with the  
 " customary appendages are used, "the two rings to hook the  
 " second horse to being here placed in the under part of each  
 " shaft. "The joints or tenants and mortice between the  
 " shafts and the cross piece" are secured "by means of iron  
 " plates both above and below, with screw pins passing through  
 " the wood and plates." "The ends of the shafts are fastened  
 " by tenant and mortice, and secured by iron plates as before,"  
 " in another cross piece, at each extremity of which is also fixed  
 " by screw pins an iron cap. In each cap is "a square hole or  
 " space," which must be continued through the ends of the  
 " cross piece, "of such a size as to admit the square of the  
 " wheel iron" "freely to enter," and by means of a screw at  
 " the ends of the cap, pressing tight against the wheel iron,  
 " the carriage or conductor may be shifted higher or lower, as  
 " occasion may require, to raise or fall the fore part of the

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" harrow." "A third cross piece or pole," to which the swingletrees are attached by chains, "lies close against that part of the wheel irons which passes through the spaces at the ends" of the second cross piece, "and is kept steady in its place by a screw pin descending through the centre of it into a small piece of wood," which is nailed to the centre of the second cross piece "for the purpose of receiving such screw pin. It has several holes at each end that the apparatus may be shifted, and the harrows drawn at different width, as circumstances may require." The ends of the chains are linked on to hooks at the end of a clasp, "which is made to hold to the pole by means of pins passing through the holes in the pole and the two ends of the clasp." The chains by which the harrows are attached to the ends of the swingletrees "are formed of different lengths to give the harrows their proper direction in working." "They are fastened to the harrows in the same manner as the chains" are to the pole, and fastened to the swingletrees by each chain being "welded or otherwise made fast" in a hole or loop at the plain end of a screw pin, which passes through a hoop or collar on the swingletree, "and is secured on the opposite side by a nut or knob, into which it screws, and on turning which the chains are regulated to great nicety." An equal distance is preserved between the harrows by means of "iron plates or stretchers;" these are "attached to the harrows by means of boxed iron pins," "which go through them and the harrow balls, and are screwed beneath by a nut;" they have a colter at top, and must be of sufficient length to admit the harrows to have play, and to rise and fall according to the variations in the land." A single plate is "attached in the same manner to the innermost ball of each inside harrow. It has a number of holes in it" so as to correspond with any alteration made in the holes of the third cross piece, as before described, "in order that the harrows may be so regulated as to miss the furrows when the land will not bear the horses." When the horses go abreast a "long swingle-tree" is used, "to each end of which is fixed by chains and clasps" "the two smaller ones at their centres." It is attached to the first cross piece "by means of a strong pin, which must be made of such a length only as that the colter shall appear just above the surface," "that there may not



"be any perpendicular play or up and down motion;" the hole through which the pin passes being "secured with plates of iron above and below to keep the wood from galling."

[Printed, not Drawing.]

A. D. 1801, November 3.—No. 2548.

JACKSON, WILLIAM.—"New invented machine or drill for drilling or sowing turnips, to be fixed to a plough beam." The seed box is situated upon "a sliding cover, whose inside closely fits the roller," the latter being made of brass, and fixed within a brass plate or frame by means of two caps and screws. The square end of the arbor of the roller is received into a square hole in one end of the axletree of "a cast-iron or wood wheel, thirty-one inches diameter," which runs on the ground, and thus communicates motion to the roller. "The brass roller hath three, four, or more sets of holes, consisting of different numbers, (vizt.) from six to eighteen in each set or circumference," and a greater or less quantity of seed will be discharged in one revolution, by moving the sliding cover so that an opening therein shall be over any one of the different sets of holes: thus, "the row of holes with six in it will sow the seed at sixteen inches distance from each other, and the row with eighteen holes in it will sow the seed five inches distance from each other; but the holes may be varied in their number, agreeable to a purchaser." The axletree is fixed, by means of two collars, to "a sliding bar of wood, two feet long, two inches broad, and one inch and a half thick;" which bar moves backwards and forwards through "a sliding cap or box," and may be fixed in any part "to suit the breadth of the furrow intended to be ploughed." Through the upper part of the same sliding box, another "wood frame," two feet six inches in length, and three inches square, the other end of which is fastened by means of a stud to the plough beam, "slides likewise to and fro, and may be fixed by the same screw," "by which motion the seed may be dropped either under the furrow or upon the surface of the ground." "The wheels, axletree, and the arbor of the drill roller join, and couple by means of a male and female square or an universal joint." Another machine is described, which consists of "a frame with two arms and two bolts." "The upper part of the wheel's

"axletree goes through the arm and frame," "and rises and falls to suit the depth you plow," "and in some measure answers the purpose of a single-wheel plow, the same wheel and the same drill, as described above." "Upon each centre a contrate wheel is fixed, of equal sizes, and a rolling shaft," "with a nut upon each end to suit each wheel; and by varying the numbers of the nuts upon the shafts you vary the quantity of seed to be sown. This drill may be used advantageously in sowing of rape and other small round seeds."

[Printed, &c. Drawing. See Repository of Arts, vol. 16, p. 120.]

A. D. 1802, February 6.--No. 2579.

SOMERVILLE, JOHN SOUTHBY, Lord.--"Certain improvements in machines for ploughing land, called double-furrow and single-furrow ploughs." One improvement in this invention consists in the addition to ordinary mould boards of "moveable cast-iron mould plates," which "will, by a screw or ketch, be made to extend at will some inches from the mould board, and will lay the furrow more or less flat, so as to suit the different purposes of working land. This principle must be indispensably necessary to two-furrow ploughs, because any attempt to produce the same effect by hand would throw one (the land one) out of work, and bury the other too deep. There is good authority to add that the moveable plate will be essentially serviceable also in every single-furrow plough." Another improvement consists in the use of "double-edge coulters" which, "being equally strong, but far more narrow, present so much less for resistance in work, and are less likely therefore to be deranged, in the remedy of which arrangement much time is lost."

[Printed, &c. Drawing.]

A. D. 1802, October 30.—No. 2655.

HOW, JAMES.—"A plough upon an improved construction." The share is made "with two mortices and furrow sides" to place two mould-boards on; and a "comin," which is hooked to a "fore tuck," "and key'd or otherwise fastened through the beam," is used "to cover the front of both boards." "The comin" "may be made large, and expanded enough to form the plough for particular purposes without any mould-boards. This plough may be used with or without

" wheels with the usual crook in the beam, as is common to  
 " foot plows, and may also be made without any comm, with  
 " a tuck within or without, or within and without the front of  
 " the boards to hook down to a loop in the share, or the tuck  
 " may be made with a knot at bottom, and go thro' a counter-  
 " sunk hole in the body of the share, and key or fasten up to  
 " the beam, as in the usual manner, or may be made to go  
 " thro' the beam and screw into the share within or without,  
 " or within and without the front of the boards, which, in this  
 " case, must be well plated round the front to keep them from  
 " separating. The boards, in all cases, must be well plated  
 " on the sides to keep them from wearing, and each to have a  
 " plate of iron, commonly called a rice, at bottom, to fasten  
 " to the boards, with a wing each. This plough may be made  
 " to contract or expand by screws to cross from board to board,  
 " the screws to be made threaded at each end, so as to con-  
 " tract or expand regularly both boards at once, by being  
 " turned with a pin, to put thro' holes made in the shank of  
 " the screws; the screws to work into an iron on each board.  
 " This plough is to be regulated at the pillow and beam to pin  
 " backward and forward in the beam, and up and down at the  
 " pillow counter hole, and to be plated round as usual."

[Printed, &c Drawing]

A.D. 1803, September 24.—No. 2736.

RANSOME, ROBERT.—"A method of making and tempering  
 " cast iron plough shares, and other articles of cast iron for  
 " agricultural uses." First, for the shares the melted pig iron  
 " is poured into a mould prepared for the purpose, formed  
 " with one side or part of iron, and the other side or part of  
 " sand or loam. The side of the share, when cast, that lays  
 " next the iron mould will be hard and of proper temper,  
 " while the other side that is formed in sand or loam will be  
 " soft, and if made of the best soft pig iron the share will be  
 " much strengthened. To make the mould for casting the  
 " said ploughshares," the patentee continues, "I proceed as  
 " follows:—First take a well-finished pattern of a ploughshare,  
 " made either of iron or other metal, then lay it upon sand  
 " or loam, carefully stopping it up until an accurate parting  
 " is made of that side of the share which is designed to be  
 " hardened; then pour thereon either lead, plaster of Paris,

A.D. 1806, April 17.—No. 2930.

PLUCKNETT, THOMAS JAMES. — A dibbling and drilling machine, which consists of a hollow roller, with bars of iron placed all round its circumference, and fastened to its two heads at about six inches asunder. Through the centre of the roller is fixed a square axle, with only a sufficient round at each end to allow the roller to turn freely about it; the square of the axle should project sufficiently through both ends of the rollers to admit of fixing to them shafts or handles. On the square axle is hung a hopper or trough withinside the hollow roller, of such dimensions as will hang freely; the mouth of this hopper may be made to any convenient size, but the bottom must be about two inches wide and of nearly the length of the roller. Fixed through the middle by a pin in a mortice in the bottom of the hopper is a tumbler, which, as the machine is drawn along, is struck successively by the iron bars placed round the circumference of the roller. "To the lower end of the tumbler is fixed a prong on a joint which will only open from the under side of the hopper so as to project perpendicularly downwards, and there be stopped by means of its joint swiveling no further round the lower part of the tumbler; therefore, this being about two inches long will strike the bars, but when doubled under the hopper by means of the joint the bars will pass freely by it without disturbing the tumbler, and consequently not let out any of the contents of the hopper, which is necessary to preserve the contents of the hopper from waste by rolling the machine the reverse way to that when at work." The dibble, the hind part of which is hollowed sufficiently to convey the grain to the ground, "is drove into the ground at the same instant the bars lift the lower part of the tumbler and prong." The dibbling machine "may be made several different ways, and the principle still be the same; such as, with cogg-wheels and with plain round holes in the bottom of the hopper, which may be replaced by a slide and screw to adjust the quantity to be delivered at each stroke of the bars against the ends of small flaps or shutters, which are fixed on a hinge and shut up the bottom of the hole every time by means of a spring wire fixed inside through the side at the bottom of the hopper which agitates the seed." The dibble in this case may be fixed to each bar, or with a

A.D. 1806, January 23.—No. 2905.

**BERRIMAN, ROBERT.** — "This machine is intended to be drawn over land recently ploughed, in order to press in the gride or channels made by the common ploughs, that no hollow places may be left for the seed to be buried too deep, and that every kind of grass, stubble, or anything else, may be pressed into the ground," and consists of "pressing wheels (of which there may be from one to three or more at the discretion of the person making or using the machine), made of cast iron, or wood bound with iron, or any other material applicable to the purpose, although," the patentee says, "I consider cast iron to be the best, but by using different materials they may be made lighter or heavier as occasion may require. The best weight seems to be about an hundred weight and a half for each wheel." A machine with three pressing wheels and three tires is described, and shown in the drawing, wherein the axletree for the fore wheel is "fastened to the frame by a nut and screw at one end, and at the other by a staple clasping it, and screwed on by two nuts," and two pieces of iron are shown, by which the machine is drawn, and which are fastened to the frame by three nuts and screws, which screws also go through the handle, through the hind axletree, and through the cross bar of the frame. Scrapers are employed "to clean the dirt off the pressing wheels in bad weather. These scrapers have a start which goes through a hole in the head of the screw that fastens on the tire." Pressing wheels with bevel edges, whereby channels are made in the ground for receiving the seed, are considered the most useful, although wheels with different edges may be used. The wheels may be placed at any distance apart the farmer may choose, "by having the hind axletree sufficiently long to admit of bolsters on each side of the wheel, which may be altered at pleasure. The tines may also be set wider or narrower, so as to go just before the wheel by means of the sliding holes in the cross bar." "One of these pressing wheels, with or without the tire before it, may be put before a common hand-drill and drawn by one horse," "or a drill may be added to the pressing machine above described, with three wheels."

[Printed, &c. Drawing. See Rolls Chapel Reports, 7th Report, p. 101.]

kind of "manure, compost, or other substance capable of  
 "being mix'd with and suspended in water or other liquid,"  
 so mixed and suspended, into channels or furrows formed by a  
 plough having two mould boards. Thirdly, in certain "mowles  
 "of combining and conveying manure or dressings to be laid  
 "on land or incorporated with the soil thereof, and in the  
 "extension and improvement of various methods of cultivation  
 "already in practice," chiefly by the use of the before-men-  
 tioned plough. Fourthly, "in the combination of any of the  
 "before-mentioned improvements in the culture of the same  
 "piece of land."

[Printed, *id.* No Drawings. See Repertory of Arts, vol. 12 (second series),  
 p. 311. Rolls Chapel Reports, 7th Report, p. 198.]

A.D. 1808, May 30.—No. 3139.

**RANSOME, ROBERT.**—"Improvements on the wheel and  
 "swing plough."

The breast plate or breast plates of the improved plough  
 are fastened in front by pins slipped into holes on the iron  
 frame, and "made fast at the heel by a screw and nut" to  
 "two sliding bars that are used for the purpose of regulating  
 "the breast plates to any width required at the heel. These  
 "are slipped into dovetails on the iron frame, which are  
 "made fast by a pin." The share is fixed by a socket on the  
 "nose of the iron ground," and a cutter is also used, "whose  
 "tenon slips into the share and fastens it to the front of the iron  
 "frame by a pin." The wresta, which are used with the turn  
 wrest plough, "are fastened to the sliding bar in like manner  
 "as the breast plates are to the sliding bars," and they "are  
 "shifted from right to left, in the whole" on the frame, and  
 "fastened with a wedge." A crotch or stay, "fixed to the iron  
 "frame in front by way of dovetail," is used for strengthening  
 the coulters. These improvements may be applied to the  
 foot or swing plough, the wheel plough, the double breast  
 plough, for the purpose of earthing or moulding root crops  
 or such crops as require it, and to the turn wrest plough.

[Printed, *id.* Drawing. See Repertory of Arts, vol. 12 (second series),  
 p. 309. Rolls Chapel Reports, 7th Report, p. 198.]

A.D. 1809, May 30.—No. 3237.

**MANLEY, EDWARD.**—"The invention relates to a plough,  
 "called or known by the name of the 'expedition plough,'"



which is "worked in a beam in the common way, and ash  
 " three different sets of feet, which may be exchanged one for  
 " the other, as required. These are more or less in number  
 " according to the size of the beam, and the different work for  
 " which they are intended." To the beam or wooden frame  
 are added " two arms or side beams to take the side feet," and  
 the plough "is worked by handles, and set by a wheel. The  
 " feet are in three sets, as before recited; a foot of the first  
 " set represents a coulter, with a share point having wings  
 " fixed behind. A foot of the second set exactly resembles  
 " that of the first, but is of a smaller size; a foot of the third  
 " set differs from the others, only in that it has a single or  
 " double broad plate fixed behind the coulter." The first set  
 of feet, "when set shallow in the ground, will either scarify  
 " or spine"; when set deep they will work up the ground and  
 pulverise it. The second set "are used for the purpose of  
 " working the ground finer; the third are used for turning  
 " the ground over in single or double ridges." A roller and  
 harrow brush are occasionally annexed to this implement.

[Printed, ed. Drawing. See Repertory of Arts, vol. 16 (second series),  
 p. 130.]

A. D. 1809, June 8.—No. 3242.

**DOBITS, MARK.**—"Plough for under-draining land."

There is hardly any description given in the Specification,  
 as it is stated that the drawing appended thereto sufficiently  
 illustrates the nature of the invention. In this a mole-plough,  
 supported on small wheels or rollers both at the head and  
 back, and guided by stilts as usual, is drawn through the  
 soil by a chain wound on a capstan. This capstan is mounted  
 on a frame secured by an anchor or hook fixed in the ground  
 and connected to the frame by a chain. It is worked by men  
 or horses.

[Printed, ed. Drawing. See Repertory of Arts, vol. 15 (second series),  
 p. 329. Rolls Chapel Reports, 7th Report, p. 202.]

A. D. 1809, July 31.—No. 3252.

**HUTTON, WILLIAM.**—"Making sickles and reaping hooks  
 " with iron or steel backs fixed upon the blades thereof."

The following is the whole Specification:—

"Take a piece of steel, hammer or roll it into a proper  
 " thickness, then cut or pare it into the form of a sickle or



" reaping hook (this may be called the blade of the sickle  
 " or hook), then tooth the blade (if for a sickle) in the usual  
 " manner; next harden the blade in the hardening mixture  
 " now used for saws, and give a temper or colour, according  
 " to the quality of the steel of which it is made, then set and  
 " grind it; the back may be made and affixed to or upon the  
 " blade in manner following:—Take a blade, made as above,  
 " pierce holes through that part intended to be affixed to the  
 " back: then take a piece of iron or steel, and hammer or  
 " draw it into the form of the back of the sickle or hook and  
 " fit it to the blade, afterwards pierce holes in the back to  
 " correspond with those pierced in the blade, and fasten them  
 " together either with rivets or screws; or the backs may be  
 " made and fastened to the blades as follows:—Take a piece  
 " of iron or steel, roll, forge, cast, or hammer it to a thick-  
 " ness, and pare it to a breadth proper for the purpose you  
 " intend it, then double it by means of a vice, stamp, or fly  
 " press, then fasten the tang unto or into the back either by  
 " welding or brazing, then hammer the back upon a anvil  
 " or block of iron or steel, so that it may be flat and level,  
 " then close the edges nearly together, taking care to leave  
 " the back part more open than the edge, in order that it may  
 " form a spring for the purpose of holding itself fast to the  
 " blade, which done, put the blade into a vice and forge on  
 " the back through its nearly closed edges with a hammer, or  
 " force the blade into the back by a wooden hammer striking  
 " on the edge of the blade; in this latter mode any number  
 " of rivets or screws may be used more effectually to fasten  
 " to the back to the blade."

[Printed, ed. No Drawings. See Repository of Arts, vol. 10 (second series),  
 p. 143.]

A. D. 1810, February 26.—No. 3809.

PRATT, Major.—"Machines for performing various agri-  
 " cultural operations by mechanical power."

Wind, steam, or other mechanical power may be employed.  
 Several machines for the purpose are described.

1. Machine for ploughing, consisting of a carriage, mounted  
 upon four wheels and divided transversely into two parts  
*which are so connected as to be capable of being moved on a  
 given distance alternately by the action of a horizontal arm*

carried by an upright shaft in the fore part of the carriage. This shaft is driven by wind, steam, or other power, and carries at the bottom a horizontal beam, to each end whereof is affixed a plough, so as to produce a circular furrow; each plough acting only during one-half of the revolution of the shaft, and being raised from the ground during the other half by curved rails on the bottom of the carriage. Straight furrows may be produced by removing the plough from the beam and fixing an equal number of ploughs to the fore and hind parts of the carriage.

2. Machine furnished with another arrangement of apparatus for lifting the ploughs when ploughing several circular furrows at the same time. This machine is moved onward by means of endless chains, extended horizontally over chain wheels, driven by gearing from an upright shaft like that before mentioned; the endless chains having arms jointed thereto, carrying transverse bars provided with spikes or holders which successively take hold of the ground. This machine may also be made to plough in straight lines by applying similar chain wheels and chains to the hind end of the carriage and substituting ploughs for the transverse spiked bars. Instead of ploughs, harrows, rollers, hoes, drills, or other implements may be applied to this or any other machine described.

3. Several drill or ridge ploughs may be mounted in a carriage which runs on four wheels.

4. A method is described of ploughing by means of three four-wheeled carriages, which travel along the field parallel to each other, with two endless chains extending between them, and passing round a single horizontal chain wheel on the outer carriages, and round a double chain wheel, driven by mechanical power on the centre carriage. Ridge ploughs being attached to the chains, two ridges will be ploughed at the same time between the centre carriage and each outer

5. Harrows or other agricultural implements may be connected to the arms of a horizontal windmill.

6. An apparatus is described for communicating motion to the endless chains and transverse spiked bars on holders before mentioned in order to propel carriages on other vehicles.

7. The carriages described under (4) may be placed in barges where there are "cuts of water," in order to plough the land between them.

8. A plough is used which appears like two ploughs fixed back to back (as in some kinds of turn-wrest ploughs), and is drawn alternately in opposite directions "by a chain and wheel the same as in Baker's patent mangle, or any wheel of alternate motion."

[Printed, 1s. Drawings. See Rolls Chapel Reports, 7th Report, p. 208.]

A. D. 1810, June 8.—No. 3343.

HICKFORD, GEORGE.—"Improvements upon the plough heretofore used for draining land and the machine for drawing the same through the ground."

The apparatus described consists of a mole plough and a windlass by which it is drawn through the ground. Instead of "the roller commonly used," the front end of the plough-beam is supported on a pair of wheels. The capstan is supported on three wheels, one of which is placed at the end of a pole, and by raising or lowering the end of the pole the capstan can be inclined to suit the inclination of the ground. If preferred this third wheel can be dispensed with, and a solid support substituted therefor. To increase the diameter of the capstan, moveable segments, united by flexible hinges, may be applied thereto. Multiplying gearing may be interposed between the capstan bar and the drum to increase the power or the speed. The capstan is secured in its place by an anchor and chain. There are also two projecting arms or stays which rest on the ground in front.

[Printed, 4d. Drawing. See Rolls Chapel Reports, 7th Report, p. 210.]

A. D. 1810, June 19.—No. 3350.

ADAMS, GEORGE.—"A new and improved method of cultivating land, and of feeding and consuming the produce thereof by cattle and sheep, and of preserving and applying the manure of and made by such cattle and sheep, by means of certain houses made and built for the protection of cattle and sheep from weather, and feeding the same therein, and moveable by means of wheels, slides, iron railways, or otherwise." The method of cultivating land according to this invention consists in manuring and planting one third of the land in the month of September, or sooner, with early cabbage; *one third more in February or March with the same sort of cabbage; and the remaining third about the same time with*

the ox or drum-headed cabbage. The first crop of cabbages will be in perfection by the month of June, when the cabbages and leaves are to be cut off, for the purposes of being eaten by cattle or sheep in moveable houses; the cabbage stalks being left cut across at the top to grow again. When a few rows of cabbages have been thus consumed, the dung and manure is to be spread over the ground and hoed in, and turnip seed sown amongst the cabbage stalks; the same process being continued till all the ground has been gone over, when, about the month of November, there will be a second crop of "keep," which is to be consumed in like manner. The moveable houses for cattle and sheep may be made of any desired size, but each one is to run upon four cast-iron wheels, mounted upon iron axletrees, and so constructed as to stand upon a cast-iron railway. The cattle houses are provided with mangers and troughs, whilst the bottoms have holes bored therein, whereby the urine can escape; the bottoms of the sheep houses must also be made so that the urine may be conveniently carried off, and the sheep kept dry.

[Printed, &c. Drawing.]

A.D. 1810, October 8.—No. 3399.

HAZELDINE, JOHN.—"Manifest improvements in the construction of a plough for the cultivation of land."

[No Specification enrolled.]

A.D. 1811, March 26.—No. 3422.

HAZELDINE, ANN.—(*A communication from John Hazeldine.*)—"Certain improvements in a plough for the cultivation of land." The patentee says, "my improvement is effected by affixing one or more knives, cutters, or dividers, in such a manner to the shelboard or share of the plough, that as the shelboard or share turns over the sward, the knives, cutters, or dividers shall cut, separate, or divide the sward into as many parts as the nature of the soil or the desire of the operator may require. The knives, cutters, or dividers may be made of iron, steel, or any other metal fit for the purpose, and may be fixed to the shelboard by screwing, wedging, coltering, or by any other method that may be more convenient, according to

" local circumstances, or may be cast in a piece with the  
 " sheelboard or share, and may cut the sward either at right  
 " angles to the surface, or at any other angle or inclination  
 " that may be more desirable. These knives may be made  
 " of a variety of shapes, but the most convenient forms are  
 " represented in the drawing.

[Printed, *cf.* Drawing.]

A. D. 1811, July 26.—No. 3468.

CUMMING, DONALD.—"Machine for reaping and cutting  
 " corn, grass, and other articles."

There is only a very brief description of the apparatus given. It appears to consist of a triangular carriage, propelled by horses yoked to a pole behind, and with one corner foremost. Along each side of the front of the carriage is ranged a series of revolving circular cutters on vertical spindles, driven by gearing from the supporting wheels. There are projecting bars, arranged to guide the crop to the cutters. The cut crop falls on an endless cloth, working above the cutters along the side of the frame. Above this are "gatherers" consisting of radial arms on a revolving horizontal spindle.

[Printed, *cf.* Drawing. See *Rolls Chapel Reports*, 5th Report, p. 57.]

A. D. 1811, October 30.—No. 3490.

MARTYN, RICHARD LOMAX.—"An instrument for hoeing  
 " turneps and other farming purposes, denominated an agricultural hoe."

The hoes or cutters consist each of a "shank" and "cutter," both of one piece "of iron, the cutter projecting from the centre at the foot of the shank, and being sharpened in front, and of the hoe piece," which is "a separate piece of iron, nearly flat, and nearly of a triangular form, but a little rounded each side toward the front or centre point, and sharpened on the two edges," and rivetted by two iron rivets "to the bottom of the shank." "Seven or any greater or less odd number of the iron hoes or cutters" are inserted, and kept fast by an iron wedge, through a wooden beam, which is annexed or hung, by iron hooks and eyes, to a wooden frame. In front of the beam, and within the frame, runs "a common wheel, either of wood or iron, with four spokes, and of two feet diameter, the stock and gudgeon whereof

"run in an eye fixed to the frame." In front of the frame are the shafts, which are fixed thereto by iron swivels, whilst a pair of common wooden plough handles are fixed to the hinder part, for the purpose of guiding the machine. "An iron index with graduated holes," one end of which is fixed through the beam, whilst the other end passes through a staple fixed in the frame, and is there fastened by an iron pin, "places the beam" "either horizontally or aslant at pleasure, so as that the cutting part of the hoe may enter more or less deeply into the ground." "The dimensions of the different parts of the machine are marked on the plans, but they may be varied according to the strength employed or the nature of the soil to be worked upon."

(Printed, &c. Drawn. See Hills Chapel Reports, 8th Report, p. 67.)

A.D. 1813, June 15.—No. 3708.

COOKE, WILLIAM.—"Improvements in the art of making and working ploughs of any kind or description." A method is illustrated of mechanically producing a mould-board with a twisting or winding curved surface, out of a solid sufficiently broad for the purpose. "It is required that such a line be generated on the upper surface of this solid as may answer for the upper edge of a mould board, able to conduct the furrow slice gently, and with an easy curvature, to its highest elevation, and then by a reversed gentle curvature to bring it over to its place of rest." The curved line obtained by the described method "will represent the upper edge of an efficient mould board, which will be found to answer its purpose well if a proper form be given to the face of the mould board," the formation of which is also described. The share of this plough forms part of the described figure of the mould-board, "being fitted to the mould board in such a manner as to preserve the required form." The diagonal edge "of the share cuts the earth in its whole length, which embraces the entire breadth of the base of" "the plough, and in this respect differs much in its action from other ploughs hitherto in use." "The coulter," which is attached to the land side of the plough, also differs considerably in its form and position from others in use; it is a segment of a circle, and occupies a space equal to its own thickness in the mould board on its land side, the front extremity of the said seg-



"ment of a circle" "coinciding with the point of the mould board and share, and the whole being fitted into a corresponding circular cavity in the iron work on the land side of the plough, in such a manner that it can be moved, when required, in the circular cavity as if turned on a pivot." The projecting point of the coulter, which by this arrangement becomes part of the share, first penetrates the soil; and, as the share wears away, the front extremity of the coulter can from time to time be turned down, and the plough brought into proper action, till the whole of the said projecting point of the coulter be successively worn away.

Another improvement peculiar to this plough, whether used as a wheel plough or as a swing plough, consists in making the beam "movable upon a pivot on the land side of the plough." From the hind extremity of the beam descends almost vertically for about nine inches a piece of iron, which "forms a segment of a circle, of which the beam from the aforesaid part is the radius; this being within reach of the ploughman, he is enabled to elevate or depress the plough at pleasure." When the plough is to be used as a wheel plough, it is necessary to introduce "between the beam and the axis of the wheels a link or two of chain, with a swivel or any contrivance that will act as an universal joint," thereby enabling the ploughman "to alter the position of the plough upon any sudden emergency, and that without having occasion to stop to alter any of the machinery." Although it is proposed that the mould-board and share should have a diagonal straight edge," still, for certain soils, another share is provided as a substitute; "it is in fact," the inventor says, "the same share that I have already described, but having a straight edge indented with curves, and all brought to an edge; the projecting points facilitating the progress of the plough through stoney soils."

[Printed, 2d. Drawings. See Repertory of Arts, vol. 24 (second series), p. 142.]

A. D. 1813, August 25.—No. 3735.

HUNT, THOMAS YATE.—"Back for scythes, reaping hooks, straw knives, and hay knives."

The following is the whole Specification:—"It consists in manufacturing a back for scythes, reaping hooks, hay and



“ straw knives, with a flange or plate of a suitable breadth to admit of holes being drilled or perforated through it, in order that the same may be rivetted or screwed to a steel or iron and steel blade, from which circumstance the said back acquires a great superiority over those manufactured on the common principle, because in that it is necessary that the holes through which the rivets pass should be drilled through the back, whereas on my plan the said holes being punched or drilled through the flange or plate, the strength of the back remains entire and unimpaired, and at the same time a degree of lightness, strength, and neatness is given to the various articles to which it is applicable, which cannot be produced by the common back.”

[Printed, &c. No Drawings. See Roils Chapel Reports, 8th Report, p. 96.]

A.D. 1813, September 23.—No. 3739.

LITTON, HENRY.—“ Certain improvements in the construction of the plough,” which consist, first, in forming the curved surface of the share and mould-board so curved with mathematical precision that the weight or pressure thereon, during the operation of turning over the furrow slice, is continually diminishing; “ the curved surface,” which is to be formed upon a block according to rules strictly laid down, may then be cut from the block to the usual thickness, which will be a mould from which cuts may be taken in the usual way.”

Secondly, “ in substituting for the sole and side plates of the plough a wheel, which performs the office of both, in order to diminish the friction which necessarily takes place in the operation of ploughs of the ordinary construction;” the novelty and peculiarity of this part of the invention, however, consists in setting the plane of the wheel “ at an angle to the horizon, so that it runs in the corner between the bottom of the furrow and the unploughed ground.”

The patentee “ further declares that these two inventions are independent of each other, that is to say, that the mould board above described may be used with a sole and side plate in the usual way, and the inclined wheel may be used with mould boards of my description.”

[Printed, &c. Drawings.]

A.D. 1813, December 4.—No. 3764.

**TYRRELL, SAMUEL.**—“A broad-cast sowing machine.” Motion is given to two rollers by means of pinion wheels, one of which is fastened to the outward end of each, which meet and coincide with cog wheels attached to the wheels of the machine. The grain or seed to be sown is placed within two troughs or bins, each of which is “divided into three equal parts, which are “severally rendered by subdivisions similar in form (in the “inside) to the upper part of a hand mill, the point in which it “terminates being in like manner an outlet through which “the grain or seed passes, in the operation of sowing, into “appropriate receivers,” from whence it is supplied through tubes to a spreading board, fastened at the bottom of the machine, by means of feeders fixed round the rollers. A regulator and crank is made use of for the purpose of keeping the machine level. “The operation of sowing commences “with the first motion of the carriage, by which the scuttles “are successively plunged in the circumvolutions of the “rollers into the receivers and emerging full of their contents, “discharge them, on their descent, on the opposite side into “the tubes, and are thence distributed by the spreading “board on the ground.”

[Printed, 6d. Drawing. See Rolls Chapel Reports, 5th Report, p. 103.]

A.D. 1814, June 18.—No. 3817.

**TINDALL, THOMAS.**—Steam engines, &c.

Among the various inventions described is an apparatus for ploughing, reaping, &c. It consists of a carriage mounted on three wheels, of which the first is used as a steering wheel. On the hinder part of the carriage is mounted a steam engine of peculiar construction, which propels the carriage by means of legs or pushers acting against the ground behind. On the front part of the carriage is fitted a mowing or reaping apparatus. It consists of scythes fitted to a frame. Neither the description nor the drawing seems to show precisely the method of application, but the scythe blades appear to be fastened in pairs to the bottom of several vertical spindles, to which presumably a rotary motion is given. Or else the whole frame is thus rotated. Below the hinder part of the carriage a plough or a harrow or a seed-drill may be fitted.

[Printed, 1s. 6d. Drawing. See Rolls Chapel Reports, 7th Report, p. 115.]

A. D. 1814, August 23. — No. 3838.

**SALMON, ROBERT.** — "Machines for making hay." A roller with curved tines is mounted on the axle of the wheels of a frame fitted with shafts for a horse. A pinion on the axle of one of the wheels engages with one on a plate carried by the frame and this with an internally toothed wheel fitted to the roller. The whole of this gearing is covered in, so as to obviate danger of clogging. The other wheel runs free on its axle. Instead of a roller, the same arrangement may be applied to a shaft carrying the tines. There is a ratchet wheel and bolt by which the plate carrying the intermediate pinion is held fast to the frame. The bolt is kept in place by a spring, which allows it to yield to extreme pressure, and thus the roller can run free on its axis. To allow of different rates of motion in the roller, pinions of different sizes may be used. The tines are fixed to cross-bars, thus forming rakes which fit in slots in the roller and are held by wedge pieces. To allow them to yield there may be springs behind them, acting against projecting pieces on the heads of the rakes.

[Printed, 16*l*. Drawing. See *Repository of Arts*, vol. 20 (second series), p. 259. *Rolls Chapel Reports*, 8th Report, p. 103.]

A. D. 1814, September 23. — No. 3844.

**DOBBS, JAMES.** — "Machines used for the cutting and gathering of grain and produce."

The apparatus consists of a frame to be driven much in the same way as a wheel-barrow, being supported on a pair of small wheels in front and by handles behind. In front are projecting arms or "dividers" which guide the corn to upright rollers between which it passes. Under these is a revolving cutter with teeth of any suitable size, according to the crop to be cut, and similar to those of a sickle. This is actuated from a winch handle at the back, turned by the man who is using the apparatus. The corn, as it is cut, falls on a small platform behind the rollers, and when this is full the apparatus is tilted over at the side to discharge the corn in a heap on the ground. Small rollers are also fitted between the "dividers." With some crops the rollers may be dispensed with. "Metallic rollers commonly called rolling shares" may also be used in a manner not further described. The apparatus may be used for cutting corn, beans, Indian corn, rice, tobacco, sugar canes, &c.

[Printed, 6*l*. Drawing. See *Rolls Chapel Reports*, 8th Report, p. 103.]

A.D. 1814, October 5.—No. 3848.

**PHILLIPS, RICHARD.** — "Certain improvements in a plough." The invention "consists in a new means or manner of regulating the depth of the plough in the ground by placing the beam on a centre or fulcrum so as to be moveable as a lever by any mechanical means or power whereby the ploughman is enabled to alter the depth of his plough at pleasure without stopping his team." A species of machinery is shewn by which the above described effect may be produced, but this does not form any part of the invention, as any species of machinery may be used to effect the same object. A segment rack is fastened to the end of the beam by a bolt, the nut of which "screws the beam and rack tight together" without the head confining the body of the plough, otherwise than to guide the beam up and down in a mortice in the body, when the ploughman thinks proper to alter the depth of his plough. This is effected by his turning a handle, connected with a shaft having a wheel on the end, which works in another wheel on the end of a second shaft, which also has a screw near the bottom end working in the before mentioned segment rack. The beam, "may be made of wood or iron at pleasure, and is moveable on a centre or fulcrum," which centre or fulcrum goes through the body of the plough."

[Printed, 10d. Drawing. See Rolls Chapel Reports, 8th Report, p. 100.]

A.D. 1815, June 14.—No. 3928.

**BROWN, ROBERT.** — "Certain improvements upon the swing wheel ploughs, plough carriages, and plough shares."

[No Specification enrolled.]

A.D. 1815, July 27.—No. 3943.

**MADELEY, WILLIAM.** — "An improved drilling machine." The patentee says, "that instead of the usual method of drilling through holes or channels in the seed wheel I have invented a taper kind of seed hole, or cap in the same, that will admit but one seed, grain, or pulse at a time, which will deliver the same into the conductor, to deposit the same at any given depth or distance that may be required." "This machine moves upon three wheels, made of cast iron or any other proper material, which stand in a triangular

"form." The "seed wheel, socket, and glands," have the  
 "main spindle passing through them, to which they are  
 "screwed, and slide along to any distance required." To an  
 iron standard within the seed hopper is screwed a brush,  
 "which keeps back all the seeds or grains except the one that  
 "the hole in seed wheel takes." The seed is let into the  
 ground by means of a plough, which is situated in front of  
 the conducting pipe. "One frame may be made to answer  
 "for beans, peas, and all other grain by shifting seed wheels;  
 "but turnip seeds requiring brass wheels, and sockets, or  
 "wheels or sockets of any other proper material on a  
 "small scale and small spindle, must be a frame for that  
 "alone."

[Printed, ed. Drawings. See Repertory of Arts, vol. 31 (second series).  
 1s. 7d. Bell's Chapel Reports, 5th Report, p. 114.]

A.D. 1815, August 23.—No. 3955.

**BESIMAN, ROBERT WILLIAM**.—"Various improvements on  
 "ploughs." The inventor says, "I make the share of the  
 "plough of such a form that the sod or furrow slice which  
 "is to be removed will be completely cut or divided from  
 "the lower soil by the edge thereof cutting horizontally under  
 "the whole width of the part to be removed, in the same  
 "manner as the coulter of the plough cuts and separates  
 "the upright of the said sod from the land; by this means  
 "the sod is completely severed and cut up from the lower  
 "soil before it is turned, making a flat bottom to the furrow,  
 "and roots and weeds of every description are cut through.  
 "Secondly, I make the mould board or plate of the plough  
 "of such form that it will turn over the sod by a uniform  
 "action with a kind of rolling motion, and without elevating  
 "or removing the sod sideways, any further than is absolutely  
 "necessary to turn it over, but turning it upon one of its  
 "angles, as it were, upon a centre of motion. Thirdly,  
 "when it is required to plough the soil to an extraordinary  
 "depth, I affix two of my improved shares and two mould  
 "plates to the same beam, the first share cutting to the  
 "usual depth and turning over the sod in the manner afore-  
 "said, the second or following shares cuts out a sod from  
 "the bottom of the furrow left by the first cut; the share  
 "is so formed as to elevate the sod without turning it

"until it is sufficiently high to be turned over upon the  
"end of the first mould plate." The improvements are  
shown applied to a plough having two wheels, and also to a  
plough made principally of iron.

(Printed, 1s 2d. Drawings. See Rolls Chapel Reports, 5th Report, p. 103.)

A.D. 1815, December 22.—No. 3971.

PLENTY, WILLIAM.—"A plough upon a new and improved  
"construction." The body, which is made of cast iron,  
is so formed as to project over the land side to admit and  
fit a curved beam, being cast so as to form at top two plates,  
one of which goes underneath the beam through which  
screw bolts pass to fix it to the beam, and the other on the  
furrow side or face of the beam. "The bottom part of the  
"cast iron body, where the share is fitted on, is cast  
"with a hollow; the convex side fills up the interstice  
"between the body and the mould plate, the concave or  
"opening being on the land side of the body, and which,  
"when the shoe is screwed on," forms a box, within which  
are the nuts and screws which fasten the cast-iron mould  
plate and share to the body. The share has a wing in a  
horizontal position, which serves as a cutter in ploughing.  
"In the space between the body and mould plate is a friction  
"wheel of cast-iron, one end of the axle of which is fixed  
"in a grooved wrought-iron arm, which grooved arm fits  
"in another groove on the land side of the body, and the  
"other end of the axle in a groove fixed to the inside of  
"the mould plate; and the axle by thus working by grooves  
"the wheel may be elevated or depressed according to  
"the proposed depth of the furrow." The fore-carriage  
consists of a carriage or gear plate of cast-iron, to the front  
and back part of which are attached two wrought-iron  
axletrees, on which run two wheels; the front or furrow  
side wheel going in the furrow and the rear wheel going on  
the land. "From the axletree of each wheel goes a screw  
"bolt, with an eye to hold the axletree, through the collar  
"round the beam by which the fore-carriage is fastened  
"to the beam; and, by means of a winch working on the  
"screw of these eye bolts, the wheels, either or both of them,  
"may be elevated or depressed at pleasure, or according to  
"the depth of the furrows. From the rear axletree a dol or



"draft chain goes to the body, and fixes by means of a  
"hook in a hole in the body, by which the draft is from  
"the body itself." The plough handles are fixed in the  
usual manner; to one of them is attached a small scraper  
over the friction wheel to keep the latter clean.

(Printed, w/d. Drawings. See Repertory of Arts, vol. 29] (second series),  
p. 101.

A D. 1816, January 9.—No. 3973.

REYNOLDS, JOSEPH. — "Construction of wheel carriages  
"and of ploughs, and other implements used in husbandry,  
"to be moved by steam, heated air, or vapour."

A steam carriage of a certain sort is described, which  
may be used to draw agricultural implements by con-  
necting the same thereto. "Rollers, ploughs, cultivators,  
"twin harrows, drilling machines, and other machines for  
"the ploughing, breaking up, sowing or cleaning of land,  
"whether single or compound, may be drawn and moved  
"by the carriage." No description is given of any im-  
provement in the construction of any of the implements  
themselves.

[Printed, 1s. Drawing. See Rolls Chapel Reports, 8th Report, p. 121.]

A D. 1816, March 23.—No. 4004.

BROWN, SAMUEL. — (*A communication from Robert Brown.*)—"Certain improvements upon the swing and wheel  
"ploughs, plough carriages, and plough shares." The  
first improvement "consists in an extra neb" "at the end  
"of the head, for the purpose of confining the share,"  
which is slipped into a groove thus produced between the  
two nebs; "and in order that the share may fit properly into  
"the neb, this groove, as well as the socket of the plough-  
"share, must be cast or wrought of a corresponding shape  
"to fit each other, which may be either of a convex form,"  
or flat, angular, concave, or of any "form at the pleasure of the  
"manufacturers." A "groove or opening in the socket of the  
"share (as seen in the drawing) "is intended to clear a bolt  
"connecting the breast and head of the plough together, and  
"the end" "on the underside of the ploughshare, are  
"designed to hold it more tight upon the neb." The second  
improvement "consists of sockets to receive the ends of the



" wooden tail and skife, to prevent the same from decaying." Both the tail and skife sockets have dovetails underfitted to mortices, by which they are attached to the head iron. " The breast or pat is attached to the plough by means of screw bolts." " The reest " is " attached to the bottom of the breast " by means of nuts and screws passing through long holes, or " where several holes may be made for the purpose of rising " or lowering the bearing of the breast upon the ground." The " last improvement is, in the construction of the carriage " for wheel ploughs," and consists of " a plate of iron with " boxes under the same," " to receive the axle of the wheels." " On the face of the iron plate are two mortices to receive " the uprights, which mortices are to be convex or dovetailed " at the pleasure of the manufacturer, provided the uprights " are made to correspond with the mortices into which they " are fastened by means of screws and bolts."

[Printed, &c. Drawing. See Rolls Chapel Reports, 8th Report, p. 115.]

A.D. 1816, June 1.—No. 4038.

RANSOME, JAMES.—" Certain improvements on ploughs." This invention applies only to the ground or bottom piece of a plough, and the share. It has hitherto " been customary to " attach or fix the share to the front end of the ground " or bottom piece, " either by making a socket or mouth in the ground " to receive the fang or shank of the share, or else by placing " the socket or mouth upon the share while the point or nose " of the ground is made with a shank or tapered end to fit " into it;" and consequently, when the cast share is worn out, the metal, which is required to form the shank or socket, becomes useless, " unless so formed as to receive a new " cutting edge, which may be fastened by means of rivets, " screws, or dovetails;" whilst " the wrought-iron share must " be relaid, new forged, or steved," which operations involve considerable expense and loss of time. This " invention goes " to remove these inconveniences," and consists in so making " the back or thick part of the share," " either in a curved or " straight form, as to enter between two chaps for the purpose " of fixing it;" whilst the share may be made " of such form " and shape as to its cutting edge, and of cast or wrought iron " or steel, or such other materials as may best suit the nature

“ of the soil in which it is to act.” The “chaps consist of  
 “ two pieces of metal, one passing above that part of the  
 “ share intended to be held by them, and the other below it,  
 “ in such manner that when they are forcibly drawn together  
 “ they may confine and hold the share in the manner of a  
 “ vice. One of these chaps may either be a part of the  
 “ plough frame or ground, and made with it, or made separate  
 “ and fastened thereto, while the other is moveable, nor is it  
 “ material whether the top or bottom chap is made to move,  
 “ all that is necessary being, that they should answer the  
 “ purpose of nipping and confining the share steadily, and  
 “ that their form and dimensions should be such as not to  
 “ impede the passage of the plough through the soil.” In all  
 cases “loops with countersunk heads and wedges” (which,  
 however, the patentee does not claim as his invention) are  
 made use of “to draw and hold these moveable pieces or  
 “chaps together to confine the share; for, although screw  
 “bolts may be used for the purpose, they are less simple and  
 “convenient.”

[Printed, *See* Drawing. *See* Repertory of Arts, vol. 35, (second series),  
 p. 257. *Rolls Chapel Reports*, 8th Report, p. 110.]

A.D. 1816, July 27.—No. 4047.

**SALMON, ROBERT.**—“Machines for making hay.” A frame  
 running on a pair of wheels has connected to it behind a  
 revolving rake, to which motion is given from the axletree of  
 the wheels either by an endless band or by toothed gearing.  
 The rake can be adjusted in height from the ground by a lever,  
 the end of which has a chain fixed thereon which can be  
 attached to a point on the shaft to hold down the end of the  
 lever and thus raise the rake.

The machines may also be used for collecting weeds, &c.,  
 and for this purpose a “sledge” or tray is mounted on a  
 carriage that can be attached to the hinder part of the  
 apparatus. This receives the weeds, &c., from the forks. It  
 is pivotted and so weighted that when fully loaded it turns  
 over and deposits its load, setting itself again when empty to  
 receive a fresh supply.

[Printed, *See* Drawing. *See* *Rolls Chapel Reports*, 8th Report, p. 110.]

A. D. 1817, April 19.—No. 4119.

NICHOLAS, EDWARD.—“A certain plough for covering with  
 “mould wheat and other grain when sown.” This plough  
 has five beams, connected together by means of “iron slates,”  
 and further strengthened by stays, which “are screwed down  
 “through the beams, and likewise through the slates which  
 “pass under the beams.” “It goes on three wheels, one on  
 “each side,” “and one before the centre beam,” all of which  
 can be made to rise or fall by means of screws. To each beam  
 is attached a cotter and a spindle with a ploughshare affixed  
 to it. The spindle to the centre beam has a “ploughshare  
 “affixed to it, which turns the mould to the right hand and  
 “to the left;” the spindles attached to the two beams on the  
 right hand “have ploughshares, which turn the mould to the  
 “right,” and those on the left hand “have ploughshares,  
 “which turn the mould to the left.” The spindles are kept  
 steady by means of stays “from the centre beam to each  
 “of the spindles, excepting the centre one.” Harrows, one  
 of which is fastened to each of the outside beams, follow the  
 plough, “for the purpose of settling the ground after the  
 “ploughing of the land.” The beams can be widened out,  
 “for the purpose of ploughing a greater surface of land,”  
 or two of the beams “may be taken off when only the outside  
 “wheels are to be used,” or “the centre beam, having a  
 “double ploughshare, may be used by itself for the purpose  
 “of hoeing,” when the two outside wheels may be used with  
 it. “The centre spindle is fifteen inches long,” “the two  
 “spindles,” one on each side the centre spindle, “are thirteen  
 “inches and a half long, and the two outside spindles are  
 “only twelve inches and a half long. But the whole of the  
 “spindles can be made to go on a plain surface by means of  
 “screws.” The plough “may be varied and adapted with  
 “regard to dimension and formation.”

[Printed at Drawing Office, Ordnance, Reports, 51, R. part D. 119.]

A. D. 1817, July 5. No. 4135.

WEDLAKE, THOMAS.—Ploughs. The patentee describes his  
 plough to have “many advantages over all that have yet been  
 “produced for strength, simplicity, and durability, as by means  
 “of a press lever, which lever forms the fore part of the breast,

" which prevents the wearing of the breast, which has hitherto  
 " been so much complained of, and which in other ploughs  
 " is called the cock iron, made of wrought iron. This lever  
 " likewise forms a part of the share by means of a wedge  
 " forcing the lever on the share, so that the share is firmly  
 " fixed on the spit. The share is so constructed that it  
 " is much stronger than any before made, and sold much  
 " cheaper." "The ploughs are composed of cast and wrought  
 " iron, or other suitable metal, with the exception of the  
 " beam and handles, being of wood."

[Printed, Col. Drawing. See Rolls Chapel Reports, 8th Report, p. 120.]

A.D. 1817, August 5.—No. 4153.

MAC CARTHY, DENNIS.—" Certain improvements on ploughs  
 " of various descriptions." To the centre and body of each  
 " of the improved ploughs is attached and affixed "a wheel or  
 " wheels, a roller or rollers, or a sledge or sledges." The  
 " breast part of the body, which is cast hollow for lightness,  
 " the hollow or opening being on the land side, and covered with  
 " a thin iron plate to fit its cavity, has a tenon at the bottom,  
 " which goes into a mortice in the share. About the middle of  
 " the breast is sunk a place to receive the end of an arm, for the  
 " purpose of bearing the axle of the wheel or roller, and in  
 " the breast, and nearly opposite to the said sunk part (on  
 " the land side), is a long hole or holes for loop, where the  
 " usual and known mould boards or wings are fixed." "The  
 " long hole or loop in the breast is made to receive the staple  
 " or hook underneath the mould board, and which admits of  
 " the mould board expanding." The improved ploughshare  
 " is made "of one piece of iron, which has a mortice in the top  
 " or instep, and has also a cross mortice," through which is  
 " driven "a common iron or wooden wedge from the land side."  
 "The improved coulter is made "to fix over and upon the mould  
 " board, on the edge next the land side, where is a dovetail  
 " or tenon on the bottom edge along the the instep part  
 " which drops into a groove or rabbit in the share," and is  
 " affixed "to the breast, share, and top of chaps by one or more  
 " stoups and common screws or pins, and nuts or keys, which  
 " pass through the top of the breast and beam on the mould-  
 " board side." *At the top of the beam is the part called by*

the inventor "the chaps, which the end of beam is let into  
 "from the land side." "At the top of the said chaps, and  
 "next the ridge, arch, or bridge of iron, is a hook for draft  
 "link or chain, and a corresponding hook at the other  
 "extremity of the said ridge, arch, or bridge close to the  
 "handle box. The ridge, arch, or bridge "is united" to the  
 "handle box or socket for handles, and to the body, breast,  
 "and chaps, leaving sufficient room beneath for the wheels  
 "or rollers to act." The patentee thus describes the wheels  
 or rollers, and method of fixing them in the centre or body  
 part of the improved plough. "These wheels or rollers are  
 "sometimes open or solid, and hollow or blank wheels or  
 "rollers, according to the nature of the work and soil. The  
 "wheel or roller that runs on the land side resembles one  
 "sometimes made use of in common ploughs) I fix with  
 "circular or straight plates of cast or wrought iron according  
 "with the form of the said ridge, arch, or bridge, which  
 "plates I fix under the nuts of the screws that pass through  
 "the breast, body, and handles; and in said plates I put a  
 "sliding groove or mortice, where the strap or arm of the  
 "axle part of the said land-side wheel or roller slides into,  
 "and is made to shift by a hole and pin and thumb screw  
 "about the centre and body. The wheel or roller that I  
 "employ and affix to this side the plough is either a blank or  
 "open wheel or roller as above described, and which I make  
 "to travel, move, draw, and glide on, over, and upon the  
 "unbroken earth and ground on the land side." When  
 sledges are used in place of wheels to the centre or body of  
 ploughs, they are formed "with circular bottoms corresponding  
 "with the same angle of a circle as the wheels or rollers  
 "present below the shoe or lower edge of the mould board,  
 "and varies in the width of edge, as do those of the wheels  
 "or rollers." The "improved expanding hoeing ploughs  
 "have the wheel or roller fixed in the centre or body, and  
 "between the wings and handles or otherwise." "The ends  
 "of the axle wheel work within the sides of the handles in  
 "two beds or sockets; the handles at their lower extremities  
 "or ends are made fast to the double share, breast, and body,  
 "or to either of them." The "improvements on double-  
 "furrow ploughs are constructed upon the same principle as  
 "to the ridge, arch, or bridge, the wheels, rollers, and sledges,

" and also the centre or knife, as each centre and body has a wheel, roller, or sledge affixed to it."

Improvements on ploughs to be worked by men (without horses) are also constructed upon the same principle as before described. The last improvement in this invention consists in a double-ended plough, worked by machines of the patentee's own invention and construction, the body part of which plough is formed in like manner to those already described. "The one point and share not in use is raised clear of the land by the points not being fixed to the breast in a straight line, but forming a curve or partial angle at the bottom of each." The various improvements, which are principally constructed of cast and wrought iron, the wheels, rollers, sledges, handles, and beams excepted, these being "occasionally made of wood, iron, and stone, are alike applied by the patentee to all and every description of ploughs used in agriculture or otherwise."

FIGURE 67. Drawing. See Repertory of Arts, vol. 35 (second series), p. 69. Rolls Chapel Reports, 8th Report, p. 127.]

A.D. 1818, May 26.—No. 4266.

DYSON, JOHN. — "Certain apparatus for the culture and tillage of land." To the back part of "a carriage, with shaft, axle, and wheels, and a small platform for currying the different parts of the apparatus," are fixed two upright bars of iron with a row of holes in each, for the purpose of receiving the hooks of two links of different lengths, to allow two strong cast-iron bars or beams, the ends of which enter between the links, to occupy a diagonal position; the beams being thereto secured, so as to allow some play in the joints, by pins with nuts on the upper side, in the manner of bolts. These beams have square holes through them perpendicularly for the purpose of receiving "shares or cutters," "so formed that when fixed in the holes the point at the lower end may be directed towards the front of the machine." "There is a boss on the lower side of each hole for making up the strength of the beam at that part. The bosses of those holes where the joints" are formed with the links "do not descend so far as the others; the reason is, that in the front beam the cutting instruments are occasionally required to



"be in those holes," "and the upper part of them then supplies the place of the pin, and in that case they require to be used with champs," which, when the nut of the cutting instrument is screwed hard up, bite upon the beam and leave the link at liberty, so that the machine has as much play as ever. The invention consists in rendering one machine applicable to various agricultural purposes, "by the opportunity resulting from the construction above described of shifting and varying the number of cutting instruments and shares, and of shifting one or both of the beams, and also in giving play to the joints where the beams are attached to the apparatus for drawing them forward, which greatly facilitates the movement and guidance of the machine." In the invention are included collars "or square hoops of iron, made to slip easily on to the square part of the cutting instruments," for the purpose of setting them higher or lower. The invention includes also "two wrought-iron arms," the top part of which fix into the end holes in one or other of the beams, and the lower part is bent and shaped so as to carry a wheel answerable to the wheels of the carriage, one to be fixed on each side of the machine, when it is required to convey the apparatus from place to place; "on putting it to work they must be taken off." It is recommended that the carriage should be made "of wood, the links wrought iron, the beams cast iron, and the shares or cutters of wrought iron, edged and pointed with steel."

[Printed, 1s. Drawings.]

A.D. 1819, January 29.—No. 4338.

THOMAS, MATTHEW. — (*A communication.*) — "A certain plough."

There is no description, but a drawing is appended to the Specification with a table of references in the margin. In this a sort of swing plough is figured with certain improvements thereon. The improvements appear to consist in making the beam of cast-iron; also the coulter and share of cast iron, and in one piece; in fitting wheels or rollers under the mould board, and apparently under the head of the beam; and in a "propelling power" to be connected to the plough.

[*Stated, 10d. Drawings.*]



A.D. 1819, May 18.—No. 4372.

**COWPER, Tkw.**—"Machines or ploughs for the purpose of "underdraining land."

A carriage mounted on wheels has fitted on it a vertical roller, to which a capstan bar is fitted. This roller is revolved by a horse harnessed to the end of the bar, and draws forward the carriage by winding up a chain secured to an anchor in the ground. In front of the plough is a circular cutter, and behind this is a coulter carrying at its lowest end a "borer" or share. Behind this again is a roller running on the ground, and intended to close up the furrow. The plough beam and with it the coulter, &c., can be raised and lowered so as to adjust the depth of working, or to raise the whole from the ground, by means of screws fixed in frames carrying rollers which rest on the ground and support the plough when raised. The capstan can also be raised by suitable gearing.

Instead of moving the apparatus as above, it may be drawn by horses in the usual way.

(Printed, *Ed.* Drawing. See Repertory of Arts, vol. 3d (second series), p. 74. *Lead.* Journal (Newton's), vol. 1, p. 13, Rolls Chapel Reports, 4th Report, p. 13.

A.D. 1820, November 1.—No. 4510.

**TORREY, WILLIAM SWIFT.**—"Certain improvements on drills "to be affixed to ploughs." To a wheel which runs upon the land and gives motion to the drill machinery, is attached a shank, which "is intended to go through the plough beam "and to be fastened by a wedge thereto," which shank, with the wheel attached, regulates the depth of the plough. An arm is affixed to the side of the drill box "for the purpose "of connecting the shank and box together by a bayonet "fastening at bottom and mortice and key at top." The axle of the wheel passes through a hole in the side of the drill box, and at its extremity receives a pinion, which gears with a cog wheel, "several pinions of different sizes are to be provided "for the purpose of changing, so as to alter the velocity with "which the cog wheel "may be required to turn." The cog wheel is affixed to the axle of the cup wheel, which axle works in a brass collar, its pivot resting in a lever. This lever is pulled down by a worn spring so as to keep the cog wheel in gear with the pinion, but when it is required to stop the

sowing of the seed, a string (attached to the lever, and passing over a pulley to the plough handle) is pulled so as to draw up the lever and take the teeth of the cog wheel out of gear with the pinion. When the action of the drill is stopped, the feeding or supplying of the seed is also stopped by means of a second lever, and a stop gauge or slider. The claw end of the first-mentioned lever, as it rises (by the means before described), lifts the short arm of the second lever, and consequently depresses the long arm (which is elastic), and, being connected with the stop gauge or slider, closes the feeding aperture, and prevents the seed from falling into the lower part of the box. "By the addition of another set of cups placed at the back of the cup wheel, two rows of seed may be drilled or sown at the same time." The patentee does not claim any improvement in the construction of ploughs, but confines his claim of originality and invention to the adaptation of the above contrivance to plough drills.

[*Printed, del. Drawing.* See *Repository of Arts*, vol. 39 (*second series*), p. 328; also vol. 40 (*second series*), p. 18; *London Journal (Newton's)*, vol. 2, p. 18.]

A.D. 1820, November 28.—No. 4513.

BANSOME, JAMES, and RANSOME, ROBERT.—This is an improvement upon an invention for which the said James Bansome obtained a Patent (No. 4038, June 1, 1816). The share in the present instance remains the same as described in the previous Specification, but the upper and lower chaps, although adopted and used for the same purpose of holding the share, have a different form and construction; "and they are fixed in a different manner, by which the parts are less liable to be out of order, and are removed and replaced with greater facility to the ploughman." The upper chap "may be made a separate piece," "or may be cast or made with and form part of the breastplate or mould-board of the plough, or be a part or continuation of the ground head or frame of the plough, as may be most convenient." The lower chap "may either form part of the ground frame, bottom piece or slide," or "may be made separate, and fastened thereto at pleasure." The loops, through which a wedge bolt passes to draw or nip the share between the two chaps, "may be of either wrought or cast-iron or steel, or any other fit material"; and they may either be made separate

from and affixed to their respective chaps, or each chap with its loop may be cast or made in one piece. It is to be observed, that when either of the chaps are made to form a part of the main frame head, ground, bottom, or blade of the plough, the loop need only be made to that chap which is moveable." "A keeping plate, with a groove on one side of it through which the wedge-bolt passes," "is bolted or otherwise fastened to the frame or body of the plough, and serves to keep the wedge-bolt steady, and in its proper direction for entering the loop or loops of the chaps. This keeping plate covers an oblong hole or slit in the frame of the plough, through which hole or slit a joggle or hooked end of the wedge-bolt passes, and by striking which the bolt is forced into or withdrawn from the loop or loops." No exclusive right is claimed for any particular form and position either of the keeping plate or the wedge bolt, but each is to be placed in such position and situation as may be most convenient for the particular plough on which it is used.

*Printed, Col. Drawing. See Reports of Arts, vol. 39 (second series), p. 521. London Journal (Newton's), vol. 2, p. 106.]*

A.D. 1821, May 1.—No. 4553.

THOMAS, WILLIAM, and LOBB, JOSEPH.—This machine, which the inventor nominates "a scarifier or hash," "consists of a cylindrical cutter, or a number of cutting wheels upon an axis connected to a carriage" for the purpose of "scarifying or cutting perpendicularly the surface of grass land to any desired depth and to any degree of closeness." To the axle of the carriage wheels are attached two upright bearers to support or carry the shaft or axle upon which the cutting wheels are placed; these bearers "are capable of adjustment as to height by means of their nuts and screws, so that the cutting wheels can be made to enter the ground to any required depth by adding a weight on the axle." The cutting wheels "are to be made of metal, or any other hard suitable substance; but most probably cast-iron wheels, with their edges ground sharp, will be found under most circumstances to be preferred." By the mode of making the cutting wheels "with a hole pierced through their centre," and with shoulders, "as shown in the drawing, there may be one or more washers of any thickness introduced between

"all the wheels so that the cutters may be put at any distance apart, and consequently will cut the ground to any degree of fineness. For this reason," the inventors prefer "to make the individual cutters separate," but consider a cutting cylinder, as above mentioned, to come completely within the principle of their invention; as also other cutters, varying in form, in place of the circular ones, may be used and applied in a similar manner to the same purpose. Under some circumstances, this apparatus may be attached "to farmer's carts, to work in breast or under the same, or to any other description of carriage or frame with wheels. When this machine is used for renewing lawns or grass land, it will then be necessary to affix above the cutters a box containing grass seeds. This box must be perforated with small holes, one hole being exactly over every cutter, so that the seed may fall immediately into the furrow produced by the cutter. It may then be necessary to follow the cutter with a roller, which may be connected to the same carriage."

[Printed, *Ed. Drawing*. See *Repertory of Arts*, vol. 43 *second series*, p. 138. *London Journal*, *Septenr.*, vol. 2, p. 250. *Holls Chapel Reports*, 7th Report, p. 122.]

A. D. 1823, July 5.—No. 4809.

OLYMER, GEORGE.—"Certain improvements on agricultural ploughs," which consist, first, "in forming the breasts or mould-boards of ploughs in particular manners applicable to different soils, the curved surfaces of which breasts or mould-boards are produced or generated by certain mathematical rules," whereby "the inclination of every part of the surfaces of these breasts or mould-boards" are caused to rise "so uniformly progressive from the commencement of cutting the horizontal furrow, to the raising of the clod into a perpendicular position and ultimately turning it over, that the least possible resistance is opposed to the progress of the plough, the force exerted in pressing, cutting, and lifting the clod being equally divided throughout."

Secondly, in causing a peculiarly formed beam to rest upon a cross piece, extending from the head of the land side of the plough, and to be secured by a bolt, which serves as a fixed fulcrum, whilst the hinder part of the beam is secured by a pin passing through it and one of several holes in the land axle, so

that the hinder part of the beam can be raised or lowered, and the depth of the ploughing thereby regulated; several rings are placed upon the before-mentioned bolt, forming the fulcrum, between the sides of the beam and the head of the land side, so that, "by shifting these rings, the direction of the beam will form a greater or less angle with the land side, and will consequently cut a narrower or broader furrow, and by this means also the plough may be adjusted to suit a single or double team."

And lastly, in a peculiar manner of affixing the coulter to the breast, by causing it to slip in between the mould-board and the land side, and to be made fast by a bolt, whilst the share "is attached to the breast much in the usual manner by bolts," and the coulter point is held by another bolt; or, the share and the coulter point may be made in one piece.

[Printed, 1845. Drawings. See London Journal (Newton's), vol. 7, p. 149. Register of Arts and Sciences, vol. 2, new series, p. 51 and 52. Engineers and Mechanics' Encyclopedia, vol. 2, p. 316.]

A. D. 1823, October 9.—No. 4852.

FINLAYSON, JOHN.—"Certain improvements on ploughs and harrows."

[No Specification enrolled.]

A. D. 1824, January 15.—No. 4888.

FINLAYSON, JOHN.—"Certain improvements on ploughs and harrows," which consist, firstly, in making an "improved share of an acute form, running in a straight line on the cutting side from the point nearly to the hinder part of the mould-board, and forming an acute angle with the land side." At the back part of this share is occasionally introduced a triangular piece or wing, "by screwing its pin into a hole in the share, which wing is by that means enabled to turn upon its pivot, accommodating itself to the way of the plough, and bringing its cutting edge against the clods of earth."

Secondly, two modes of constructing the beam, in order to prevent the plough from choking at the coulter, the first of which consists in curving the beam upwards, the coulter being introduced at the underside, and made fast by wedges; "the other consists in opening the beam by lateral curves," "the

" colter being attached by screw bolts, and rounded or cut off at top."

Thirdly, improved modes of adjusting the draught of a plough. The depth at which the share shall cut the ground is regulated by means of a screw, which passes through the bolt of the drawing shackle, and by being turned moves the shackle higher or lower. The lateral draught of a plough, so as to give the share more or less land, and also to enable it to be drawn by a single or double team of horses, is regulated "by the addition of a bar," affixed to the body of the plough, to the end of which one of the drawing shackles is to be attached." This lateral bar, which slides in a horizontal direction upon the muzzle plate, "may be set at any angle to the beam, and being there fixed by a bolt, will cause the plough to follow a certain course to which the draft, by the adjustment of the bar, will incline it."

Fourthly, a "skeleton plough, designed for wet land," in which, instead of the usual mould-board and land side, those surfaces are produced by bars or rods of iron cradled together."

Fifthly, a new harrow, formed of bars, which support tines made in such a curved form as will enable the stubble, roots, and other vegetable matters to rise up over the tops of the tines, and clear them." This harrow is carried on three wheels, the carriage of the fore wheel being connected to a lever bar "by the raising or lowering of which the situation of the fore wheel is altered, the nose of the harrow raised to any required distance from the ground, and, consequently, the depth that the tines will be permitted to penetrate will by these means be determined." The handle of the lever slides between a spring guide at the hinder part of the harrow. "These spring guides consist of two rods placed close together, with swells or bends forming open spaces at several parts of the guide for the lever to rest in." The hinder wheels are to be raised or lowered to correspond with the fore wheel by means of screws, which pass through the end bearings of the frame, and into the axle of the wheels, by the turning of which screws the hinder part of the harrow will hence be raised or depressed."

Sixthly, "a horse hoe or drill harrow, with peculiarly formed tines attached to the framework." "This peculiarly formed tines is designed to permit the stubble or other vegetable



" obstructions to rise up over its top, and thereby to relieve  
 " the hoe or harrow from choking." At the sides of this hoe  
 are introduced scufflers, "the stems of which are formed much  
 " in the same way as the tines of the harrows."

(Printed at Drawick. See London Journal (*Newton's*), vol. 9, p. 118;  
*Mechanics Magazine*, vol. 2, p. 365.)

A.D. 1827, April 4.—No. 5481.

STOTHERT, HENRY ASPREY.—"Certain improvements on or  
 " additions to ploughs," which include, firstly, a regulator with  
 holes in it, connected to the draught rod, "having a deep  
 " socket at each side, which allows the regulator to slide up  
 " and down the guide bars that support the head of the plough,  
 " and thereby adjusts the line of draught to the height of any  
 horse's shoulder. Sliding on the regulator sideways is a  
 " gear bed, which clasps the regulator, and is the means of  
 " connecting the draught rod with the traces." The invention  
 of another gear, suitable for a one-wheel plough, and which,  
 " by means of two sockets, wherein two pins connected with  
 " the regulator slide up and down, produces the same effect "  
 as the one previously described, is also claimed. Another part  
 of the invention relates to "the mode of raising or lowering  
 " the land wheel by means of a screw and nut, secured in a  
 " guide socket at one end of the axle bed," "for regulating  
 " the depth of ploughing, and at the same time keeping the  
 " plough upright. The aforesaid screw and nut are set in a  
 " long dovetailed mortice."

The handle, which is on the top of the screw, "has a sliding  
 " socket, terminating in a finger, which, dropping behind the  
 " cross head, causes the screw to be stationary at any height."  
 The beam of the unproved plough is connected with the screw  
 by means of a cup and ball joint, which rests upon the nut,  
 and enables the plough to incline on either side, on turning  
 round at the end of the furrow. Another part of the invention  
 relates to the arrangement of a head gear of a swing plough.  
 The draught of this swing plough is fixed by means of a screw,  
 which is turned by a handle and works on a cross bar; which  
 cross bar is connected, by the slides working through sockets,  
 with the regulating bar, to which the draught rod is attached.  
 The handle of the screw has a sliding socket, which drops  
 behind the cross bar, and fixes the screw to any height required.  
 This invention relates, lastly, to "the principle of the con-



"struction of the turn furrows," first, as regards the form. "Every section of this turn furrow, whether longitudinal or transverse, forms a straight line." Secondly, as regards long narrow mortices for admitting air to prevent the adhesion of the soil. Thirdly, as regards holes "for attaching the cutter or cutter's knife or knives," which are so shaped as to clear the furrows "horizontally, or nearly so, in passing."

[Printed, *8d*. Drawing. See Repertory of Arts vol. 4 (*third series*) p. 305. London Journal (*Newton's*), vol. 2 (*second series*), p. 335.]

A.D. 1827, May 19.—No. 5498.

COGGIN, THOMAS PATRICK.—"A new or improved machine for the purpose of dibbling grain of every description." In this machine, a reciprocating motion is given to two rollers, each of which is furnished with two sets of cavities, one for the purpose of measuring seed, and the other manure, from two separate compartments in each hopper, by simply twisting two dibbling irons in opposite directions, the axes of such rollers being coupled together, and connected to the wrought iron stem of one of the dibbling irons by means of a bar, which is attached by a ball and socket or universal joint to an arm projecting from an adjustable collar fixed on the stem, whilst the other end of the bar is attached by an universal joint to the upper end of a short crank arm connected to the axes of the rollers. The effect of this arrangement is that, when the two cones of the dibbling irons are pressed down by the foot, and the handles of the dibbles are twisted by the operator in opposite directions, the measuring rollers are caused to turn partly round, and to deliver from each a measure or cell full of grain and also of tillage into a lower hopper or punch, whence the seed and tillage are conveyed together into holes previously made by the cones. The invention consists, the patentee says, "in constructing and applying rollers" "for measuring the quantity of seed and tillage to be conveyed into holes that have been dibbled; also, in combining such measuring or feeding rollers with dibbling irons by means of an adjustable collar and arm, likewise a connecting bar and crank arm, by the application of which, in the manner and way herein described, I am enabled to communicate reciprocating motion to my measuring rollers, an advantageous effect never before produced in any machine made for the purpose of dibbling."

[Printed 70<sup>l</sup>. Drawing. See London Journal (*Newton's*), vol. 2 (*second series*), p. 335.]

A. D. 1827, July 12.—No. 5523.

VAZIE, ROBERT.—“Preparing, extracting, and preserving  
“ various articles of food.”

Among other matters the inventor describes what he terms  
“ a corn preserver.” No special implement or apparatus is  
alluded to. A stake is driven into the ground and round this  
some eight sheaves are piled. A larger sheaf is then impaled  
on the top of the stake with the ears downward so as to form a  
sort of cover for the other sheaves.

*Printed, ed. Drawing.* See Repertory of Arts, vol. 7 (*third series*), p. 47.  
1828. *Journal (Newton's)*, vol. 3 (*second series*), pp. 193 and 205. Register  
of Arts and Sciences, vol. 2 (*new series*), p. 211.

A. D. 1828, April 26.—No. 5642.

GRIFFIN, JAMES.—“Scythe backs, chaff-knives backs, and  
“ hay-knife backs.”

The object of the invention is to do away with the necessity  
for rivet-holes in the backs of the blades of such implements  
when the back and blade are rivetted together. For this  
purpose the back is formed with studs which fit into corre-  
sponding holes in the blade and are hammered down in the  
usual manner. To form the back, a heated bar of iron is  
passed between rollers, one of which has a groove on it of the  
proper shape to form the back. In the groove are sunk holes  
which form the studs. The other is plain, as the studs are  
only required on one side.

*Printed, ed. Drawing.* See Repertory of Arts, vol. 9 (*third series*), p. 11.  
London Journal (*Newton's*), vol. 4 (*second series*), p. 530.

A. D. 1830, July 1.—No. 5950.

CLIVE, JOHN HENRY.—“Construction of and machinery for  
“ locomotive ploughs, harrows, and other machines and  
“ carriages.”

There are no improvements in the implements. The im-  
provements described refer to traction engines, which, among  
other purposes, may be used for drawing ploughs, harrows,  
&c. “by ropes, chains, or other braces in the same manner  
“ as carriages are now drawn after such locomotive machi-  
“ nery.”

*Printed, ed. No Drawings.*

A.D. 1830, August 13.—No. 5982.

KNOWLES, JOHN.—“Machinery for drawing up hop poles  
“out of the ground.”

A long-handled fork with serrated prongs is pivotted to the top of a short stand or crutch. The hop-pole is grasped by the fork near the ground and drawn out of the ground by depressing the end of the lever handle. The crutch is formed with a broad foot to prevent its sinking into the ground, and has a short spike in the foot to prevent its slipping.

[Printed, 4d. Drawing. See Repertory of Arts vol. 10 (*third series*), p. 538; *L. d. d. Journal* (*Newton's*) vol. 9, (*second series*) p. 77. *Revue of Arts and Sciences* vol. 5 (*new series*), p. 160. *Engineers' and Mechanics' Encyclopedia*, vol. 1, p. 632. *Rolls Chapel Reports*, 7th Report, p. 132.]

A.D. 1832, May 15.—No. 6267.

HEATHCOAT, JOHN.—“Draining and cultivating land.”  
The apparatus is to be worked by steam or other power, and is intended for ploughing, rolling, harrowing and draining land, it is adapted for use on bog lands which cannot be conveniently tilled in the ordinary way.

1. A carriage of large dimensions is fitted with a steam engine or other motive power machine and suitable winding gear; it is mounted on a series of wheels, which conduct an “endless flexible floor, railroad, or way” within and upon which the carriage is caused to travel. This “affords a very broad and extended surface for the purpose of sustaining a carriage of great weight upon soft, swampy, boggy, or unstable land.” The “flexible floor” is made of painted or tarred sailcloth stretched on strips of metal. This carriage travels along a sort of roadway, formed across the bog and laid down in grass. A drain is cut at each side of this road, and there are cross drains running into these.

2. In some cases the carriage may be mounted on broad rollers or drums instead of the wheels and flexible endless floor. It may then be employed as a heavy rolling machine as well as for giving motions to the ploughs, &c.

3. The carriage may also be mounted on wheels “proper for travelling upon land or soil of a sufficiently firm and compact nature, in order to simplify the application of the machinery and apparatus to the culture of such soils.”

4. "Auxiliary carriages" are placed "on each side of the principal carriage, at a distance from it, and parallel therewith." By means of ropes, &c. "issuing from and actuated by the machinery of the principal carriage, and passing round a wheel, pulley or barrel on the auxiliary carriages," the ploughs or other implements are drawn to and fro between the principal and auxiliary carriages. As the principal carriage travels along the field, the auxiliary carriages are caused to move at a corresponding rate. A special construction of engine is described, and when required, the principal carriage may be moved to any place where the power of the engine may be used for working corn mills, thrashing machines, chaff-cutters, &c.

[Printed, 2s 2d Drawings. See London Journal (Newton's), vol. 8 (continued series), p. 329. Rolls Chapel Reports, 5th Report, p. 144.]

A. D. 1832, July 19.—No. 6284.

WEDLAKE, THOMAS, and WEDLAKE, ROBERT.—"Certain improvements in ploughs," which include, firstly, a mode of applying and adjusting a screw spindle, in order to regulate the position of the beam, and consequently the draught of the plough. The beam is united to the frame or body of the plough by two bridle irons, which are applied, and united by screw bolts, one to each side of the hinder end of the wood beam, and passed on each side of the upper part of the body, being fastened thereto by a bolt as a centre of motion, and a wedging plate and wedge key, to secure those fastenings and take off the stress from the screw spindle. The beam is retained in a proper position in respect to the body by a screw slide or sliding nut, "the ends of which are formed into round or square pins," and "are received into holes through the bridles." "The same pins" of the sliding nut "pass through two upright slits or oblong holes," whereof one "is formed in the upper part of the frame or body," and the other is formed in a box, which is fixed to the frame at the side thereof by two screws, so as to leave a cavity between the two in which the sliding nut can move up and down by means of the before-mentioned adjusting screw spindle, which is fitted into the box, the slide being tapped for the screw spindle to pass through it. When the screw spindle is turned round in one direction, by means of a winch applied to a square on the

upper end thereof, the screw slide will be elevated in respect to the frame or body, "and consequently the foremost end of " the beam will be raised so as to elevate the point of traction " whereby the plough is drawn; the hinder or lowermost end " of the bridles " moving about the bolt," by which they are united to the body as a centre of motion.

Secondly, the improvements relate to a share applicable to a plough containing the aforesaid improvements, and consist in a mode of making the cutting part, which is called the blade, wing, or joint, in a distinct piece of cast metal from the part called the cray or sock of the share, the two pieces "being " formed so as to put together by an interlocking junction, " and secured from separating by one pin." The blade, wing, or point "may be made of steel or wrought iron, or of cast iron, the cutting edge thereof, in case cast iron be used, being " chilled in casting to render the metal case hardened." "If " it is desired to have a steeled cutting edge to the blade, " wing, or point, it may be done by forming the cast metal " blade with a rebate along its border to receive the steeled " edged, which may be fastened on by rivetted pins, or by " allowing the melted iron to flow through the rivet holes."

[Printed, &c. Drawing. See London Journal (Newton's), vol. 11 (conjoined series), p. 233.]

A. D. 1833, June 6.—No. 6434.

MADELEY, CHARLES.—"A scriber or harrow" composed of wrought-iron bars in each of which are four obtuse angles. "The bars are placed lengthways to the line of draught, and "are braced together edgewise at equal lateral distances " by wrought-iron arched ties, fastened by pins and burs. "The ties are two feet two inches long, flattened at each end, "with a hole drilled through it for the pin to go through, "and are round in the centre, and bent into a bow or arch, "sufficient to keep the bars fifteen inches apart." There are three curved tines attached to each bar, the head of each tine being made to embrace the bar at each side, and these fastened by a pin and bur. "When the bars are fastened together at "the distance above-mentioned, namely, fifteen inches, each "tine, by means of the obtuse angles "in the bars, takes a "separate direction in lines of five inches from each other. "The harrows are attached to an axle by means of a couple

"attached to each bar," the couple being "attached to what is usually called by husbandmen a clevis," fixed in the axle, and having three or four holes drilled in it, in order to raise or lower the harrows. To the hinder part of one of the bars of each harrow is attached a regulator and "sword," the head of the regulator being "made to fit the sword, so as to be raised or lowered at pleasure." "The sword is ten inches long, and there are five holes drilled through it, in order to raise or lower the regulator. It is made to bestride or embrace the bar at each side, and is fastened to it by a pin and collar. By raising or lowering the regulator, and by raising or lowering the harrows at the axle, the depth to which the tines are wanted to go into the ground is regulated. The harrows may be made of any size, according to the number of bars attached together, and either single or double." In one of the drawings is "shewn a perspective view of a double harrow of six bars, the two middle bars not being braced together, in order for the better and more effectually working uneven land." In this invention is claimed "the zig-zag or angular form of the bars whereby each tine is made to take a different line of action from any other of the set, the mode of placing the bars," "and the arched ties by which the bars are braced together."

[Printed, &c. Drawing See London Journal (Newton's), vol. 14 (con-journal series), p. 244.]

A.D. 1835, November 2.—No. 6918.

SPRINGALL, JOHN, and RANSOME, ROBERT.—"An improved mode of manufacturing certain parts of ploughs." The patentees say, "having found from experience that" "shares and blades, when made of steel and formed by stamping or pressing, are apt to break or split in the dies or rollers, we have, in many instances, adopted the plan of making the share or blade complete entirely of wrought iron first, and afterwards subjecting the manufactured article in its complete state to the process of converting iron into steel, which we have found highly advantageous, inasmuch as it gives us every facility required for shaping the metal in the dies, while it enables us to obtain a temper in the article for use, which is of the greatest importance, in some cases, to the plough. Now" "we claim as our invention



" the manufacturing of ploughshares and blades, or wings,  
 " or whatever that part of the plough may be called which  
 " makes the horizontal cut in the land in the work called  
 " ploughing, as before described, of wrought iron or steel,  
 " either or both, stamped or pressed into the form required  
 " by means of dies and presses, or stamps, or by rollers, or  
 " any the like suitable machinery. And " we further " claim  
 " forming the said shares and blades or wings complete of  
 " wrought iron only, and then subjecting them, in their  
 " finished state, to such known processes as will convert the  
 " iron of which they are made into steel."

[Printed, 1s 2d. Drawings. See London Journal (Newton's), vol. 10 (continued series), p. 142.]

A. D. 1835, November 2.—No. 0919.

KEENE, WILLIAM.—(*A communication from Messieurs Hugues and Loste.*)—Apparatus or machinery for sowing seed, and manure, consisting principally of a case, the upper part of which is divided into two compartments—one for the seed to be sown, and the other for the manure; the upper part of the case being divided from the lower part by means of a shifting slide, which may be drawn out or pushed in by a button.  
 " In the length of this slide are transverse slides, which may  
 " be opened and shut at pleasure, to let out or retain the  
 " corn in the superior part of the case. On the transverse  
 " slides being opened the grain falls into cavities made in the  
 " circumference of a cylinder," which, together with a  
 " grooved or canulated cylinder," for delivering the manure,  
 " are made to revolve by either a ring eccentric or a crank, or  
 " any other means producing a rotatory motion," the motion  
 " being derived from a large wheel which revolves upon the  
 " ground, when the machine is drawn or driven by man or  
 " animal power, and communicated by a shaft, at the openings  
 " made by the transverse slides. "To permit the grain to fall  
 " into the cavities of the cylinders there are springs, which at  
 " the same time that they prevent more grain entering than  
 " will fill the cavities, yield or uplift to any stone, pebble, or  
 " extraneous hard substance which may get into the cavities with  
 " the grain, and permits it to pass, closing down again immediately afterwards, in virtue of its elasticity, and thus maintain  
 " *regularity* in the quantity of seed carried off by the  
 " *cylinder in its rotation.* The cavities in the cylinder are in



"series of circles around its circumference, and these circles of cavities are in series of various sizes, appropriate to the grain to be sown, and the grain falling from the cylinder into hollow socks," is sown in furrows, cut by the said socks, at such distances as may be regulated at pleasure by suppressing the communication of the seed box with the socks, or taking out one or more of the said socks." "The grain and manure are guided into the socks by tubes fixed in opposition to the circles of the cylinders destined to give out the grain and manure." A rake is joined by a loose hinge to the hind part of each sock, for the purpose of covering the seed. This invention is confined to "the combining of the various parts, as above described, whereby the corn or grain, and manure, together or either separately, are regularly delivered and sown in the furrows made by the machine, and the seed covered with earth by the rake attached to the socks after being sown."

[Printed, &c. Drawing. See Repertory of Arts, vol. 6 (new series), p. 87. Lond. in Journal (Newton's), vol. 13 (conjoined series), p. 94.]

A.D. 1836, June 13.—No. 7118.

VAUX, THOMAS.—A revolving harrow, which consists of two wheels with curved or bent teeth or spikes affixed to leaves or bosses, the axes of which "are capable of being moved to or from each other by slots or slits formed in the side frame," or inner "framing which carries the part of the rotatory harrow." This frame moves on an axis at one end, whilst at the other end rise "racks," such racks being guided by moving between guides on standards, which are affixed to the main framing of the machine, and descend below such frame so as to receive the axis of two wheels, one of which runs on the unploughed land, and the other on the ploughed land, the latter having a spike, supported from a lever from its axis, following in its track, and opening the earth as it proceeds. The depth to which the teeth or spikes of the harrow shall penetrate into the ground is regulated by means of cog wheels that, taking into the racks, raise the inner frame, and with it the revolving harrow; such cog wheels being set in motion by means of a wheel affixed to an axis turning in bearings, and having handles by which it can be made to revolve. To an axis, having a handle affixed thereto, which axis "slides in

"bearings at each side of the framing of the harrow," "are affixed clicks or catches, which, taking into the racks, retain them in any desired position." The horses are harnessed to certain rings attached to a transverse bar; such bar "having a square opening to receive the square projecting pin" of a frame, "which carries the axis of the wheels or rollers" in front of the machine; such projecting pin passing through an adjusting socket, screwed to the transverse bar, which ties the front of the side framing together; "that portion of such pin" "which passes through such socket being cylindrical, moves in that bar as an axis, and produces the necessary locking motion in order to turn the harrow, or to cause it to move in a curved direction." A wheel, the axis of which is carried by a side framing affixed to one of the side frames, "runs in the furrow produced by the plough," this harrow being "intended and purposely framed for following a plough." The patentee says, "I lay no claim to the separate parts of which the harrow or its framing are composed, but do confine myself to the constructing revolving harrows that the teeth or spikes of one part of the harrow in their revolution shall enter between, and, in working, tend to clear the teeth or spikes of the other part of the harrow." "And I do further claim the combination of the other parts," "when used in conjunction with the mode of arranging the teeth or spikes of the harrow."

Printed, 10d. Drawings. See Repository of Arts, vol. 4 (new series), p. 215. London Journal (Newton's) 1 18 (continued series), p. 30.

A. D. 1837, August 2.—No. 7413.

ROSSER, ARCHIBALD RICHARD FRANCIS.—(*A communication.*)—"Improvements in preparing manure and in the cultivation of land."

The Specification does not really include any matters connected with the present series, and is only referred to here on account of the allusion in the title above quoted to "the cultivation of land." The patentee describes a method of mixing up various waste matters into manure and mingling the compound thus formed with straw, furze, &c., the whole being finally applied as a dressing to land. The component materials include fecal matters of men and animals, urine, soot, powdered gypsum, unslacked lime, saltpetre, wood ashes, "sea

"salt," "levain d'engrais" or "leaven of manure," which is the "last drainings from a preceding operation," also "kitchen water," "sweepings, dead animals, spoiled provisions, and filth from the dwelling house."

[Printed, &c. No Drawings. See Repository of Arts, vol. 2 (new series), p. 109. London Journal (Vivian's), vol. 12 (conjoined series) p. 104.]

A.D. 1837, September 28.—No. 7425.

**ARMSTRONG, WILLIAM, junior.** — "Improvements in ploughs," which consist, firstly, in a mode of constructing the share and part of the frame which enters the socket of the share, the principal feature of novelty being that the socket is formed having a raised projecting surface cast thereon, and a corresponding concave groove is formed or cast on the plug or projecting point of the frame of the plough, which enters the socket of the ploughshare.

Secondly, the invention consists in an arrangement of apparatus for regulating the draught of a plough. A rod, to which chains or coupling rods are connected, takes into openings, higher or lower, as the case or nature of the land requires, in the frame or body of the plough; or, in place of having openings, a rack may be used, when combined with other parts of the arrangement here described; or, in case the nature of the land is such as to require the bar to be removed, the coupling chain or links are to be connected to a hook, which is attached to the beam. The coupling rods pass through a vertical bar placed at the head of the beam, and, as this bar is capable of being raised up and down, and retained in any position by means of a screw, the draught may at all times be kept at or near a parallel line with the surface of the land.

Thirdly, the invention consists in a mode of affixing the coulter by the application of cross wedges. The socket or opening, cast or formed with the frame of the plough, and through which the coulter passes, has holes formed therein, through which wedges can be driven horizontally across the coulter, and cause the latter to be held more securely in the socket, than by the ordinary mode of driving wedges in the socket with the coulter.

Fourthly, the invention consists in a mode of fastening the share to the frame by means of a rod, which, in place of passing through a hole in the stay or bar which connects the

mould-board to the frame, passes through a projection formed on the frame, in such manner that the rod shall come close, or nearly so, to the frame of the plough; "the bar" "being in" position intermediate of the frame and the mould-board."

"Any one or more of the improvements may be used separately from the other or others"; the other parts of a plough shewn in the drawing, and which are not claimed as part of the invention, may be varied in their construction.

[Printed, &c. Drawings. See Repertory of Arts, vol. 9 (*new series*), p. 337; London Journal (*Newton's*), vol. 18 (*conjoined series*), p. 32.

A.D. 1837, October 14.—No. 7446.

VAUX, THOMAS.—"Improvements in tilling and fertilizing land."

[No Specification enrolled.]

A.D. 1838, April 21.—No. 7622.

FINLAYSON, ROBERT.—"Improvements in harrows" which are comprised under six heads. The first consists in an improved construction of the frame of the fore wheel, which turns on a pin inserted into its staff, in such manner as to insure the wheel running fair behind the muzzle of the harrow in turning, &c.

The second is a mode of so connecting the staff of the fore wheel with a lever, as to allow it to be lengthened or shortened at pleasure, and to render the leverage power complete in raising the tines out of the ground, or allowing them to enter at the required depth; this lever, which, a little behind its attachment with the frame, passes through a mortice in the staff of the fore wheel, on which it acts as a fulcrum, has its short arm attached to the front of the frame, and its long arm extending backwards, through an upright frame or guide, to within reach of the attendant. By this arrangement the frame with the tines can be raised or lowered at will.

The third consists in the altered form of the tines. The frame and cross bars of the "grabber harrows" "are generally made of wrought iron, but they may be made of cast iron or wood." "The cross bars support a peculiar sort of tines;" "the first is called the *dinotherium giganteum* tine, from its form being taken from the front teeth of that extinct animal; and the second is called the outrigger tine, from its

" position at the outside of the shoulder of the frame. These  
 " tines are placed before the cross bars, and pass through  
 " them from before backwards, instead of passing through the  
 " the cross bars from below upwards."

The fourth consists "in the altered situation and mode of  
 " adjusting the hindermost wheels, 'to the axles of which is  
 annexed a revolving handle, fixed by a pin going through the  
 handle into a quadrant dial placed at the inside of the wheels.  
 By turning this handle the hindermost wheels are brought  
 nearer to, or are removed further from, the frame, in order to  
 enable the tines to work at the requisite depth. " Besides  
 " this simple mode of adjustment, the hindermost wheels are  
 " placed more forward at the sides of the frame than in the  
 " original harrow, which renders it stiffer, an object of great  
 " value in working strong land."

The fifth consists in the application of the before-mentioned  
 outrigger tines to work or remain at rest, according to the  
 strength of the cattle or stiffness of the soil.

The sixth consists in the application of cast-iron hoes, when  
 wanted, to fit the tines of the grubber or drill harrow; they  
 can be put on at pleasure, when the object is to cut the weeds  
 under the surface.

A horse-hoe or drill harrow, on which the cast-iron hoes may  
 be put at pleasure, is shown in the drawings. "It has seven  
 " tines, the front one in the form of a duck-footed coulter."  
 The cast-iron hoes, and improvement in the form of the duck-  
 footed coulter, are all that is claimed as new in this imple-  
 ment.

[Printed 19d. Drawings. See Repertory of Arts, vol. 11 (new series),  
 p. 36, London Journal (Newton's), vol. 18 (conjoined series), p. 104.]

A.D. 1838, April 24.—No. 7624.

VAUX, THOMAS.—"Improvements in tilling and fertilizing  
 " land."

[No specification enrolled.]

A.D. 1838, November 8.—No. 7847.

WESTERN, CHARLES CALLIS, BARON.—This invention relates  
 to improvements in drills, and consists, first, in the addition to  
 the fore part of an ordinary drilling machine of a fore axle and  
 pair of fore wheels, with a steering apparatus attached thereto.

This fore axle turns on a pivot, by which it is attached to a framing, which connects it with the main frame of the drill. The wheels, which are made of cast iron, and turn in bearings bolted to the under side of the fore axle, have their peripheries feathered off to a sharp edge, for the purpose of cutting through clods of earth. On the top of the main frame of the drill is fixed a seat, and within easy reach of a workman sitting thereon is a wheel, with handles, by which the machine is steered; this wheel being fixed at one end of a shaft, a screw on which is received in a socket or nut mounted in a plummer block, whilst the opposite end of the shaft has two collars, between which a forked standard attached by a pin to the fore axle, so as to form with the plummer block a universal joint, works. By this arrangement, the course or direction of the machine is governed whilst in motion.

Secondly, in the application of "improved metallic joints or hinges to the levers," on which are fixed the funnels or pipes which convey the seed to the rows or furrows, and "by which they are kept perfectly parallel to each other, and in a line with the course of the machine."

Lastly, in the application of metal sockets to the levers, by which the shares or coulter are fastened thereto, in lieu of the mortices formerly made in the levers."

[Printed, 1s. Drawing. See London Journal (Newton's), vol. 22 (continued series), p. 432.]

A.D. 1838, November 8.—No. 7866.

WINROW, JOHN.—"Certain improved means of and apparatus for destroying weeds and insects on land." The invention "consists in the novel application of a means or method of applying heat or hot air or a blast of heated air or steam, either separately or combined together, or even combined with any chemical gas or vapour, for effecting the above objects and purposes; and also in certain novel or improved apparatus or machinery whereby the said hot air, steam, or gas is generated and brought into contact with the weeds and insects intended to be destroyed (that is to say): the apparatus is portable or locomotive, and capable of being drawn over the land intended to be cleaned either by manual labour or other power, and the apparatus, in the first place, consists of a carriage or framework supporting a fireplace



“ wherein the heat is to be generated ; also, if necessary, a  
 “ blowing apparatus (as rotatory fans or bellows) for produc-  
 “ ing an increased heat and a blast of hot air, together with a  
 “ boiler properly supplied with water for the purpose of  
 “ generating steam ; and when weeds are to be removed from  
 “ the ground the apparatus may be furnished with rollers for  
 “ breaking up the clods or lumps of earth, and also with  
 “ harrows, pickers, or hoes for stirring up and distributing the  
 “ same, and dragging the weeds out of the land and exposing  
 “ them, as well as the insects and their eggs, to the destruc-  
 “ tive action of the hot air or steam which is directed upon  
 “ them as the apparatus passes over the land.”

“ In the second place the apparatus is more particularly  
 “ applicable to such crops as are sown in rows or drilled, and  
 “ is constructed without the rollers or harrows, and is to be  
 “ passed over the young parts of the crop without injury to  
 “ them, but having jets or streams of hot air or steam issuing  
 “ from out of the apparatus between the rows of plants,  
 “ whereby the flies or other winged insects which are preying  
 “ upon or injuring the plant are disturbed by the apparatus  
 “ passing over the ground, and brought into contact with the  
 “ hot air or steam, and thereby destroyed.” Any apparatus  
 “ or means for generating deleterious gasses may be applied  
 “ to these apparatus,” to which may be also adapted “hoods or  
 “ bonnets or channels,” “ for the purpose of partially enclosing  
 “ the rows of plants as it is passed along ; and into these hoods  
 “ or channels the deleterious vapours or gasses (as, for instance,  
 “ fumes arising from burning sulphur) may be thrown.”

Printed, &c. Drawing. See London Journal (Newton's), vol. 14 (con-  
 sidered as vol. 14), p. 353.]

A.D. 1838, December 15.—No. 7905.

**VAUX, THOMAS.**—This invention relates to a mode of re-  
 covering and improving land, and particularly waste and poor  
 land, and consists in “tilling and sowing or planting only  
 “ small portions or parts of any quantity, leaving the other  
 “ parts of the land and surface in grass or other vegetable  
 “ pasture, by which means winter food for cattle is obtained,  
 “ and also a good and clean surface for sheep to tread and lie  
 “ on during the winter is secured.” In order to carry out this  
 invention, about twelve inches square, or more, of the surface



is pared off, and then at an equal distance, another square of equal size is removed, only one fourth of the soil being tilled at the commencement, although the whole may, by degrees, be brought into cultivation. On poor land, when it is inconvenient to apply manure, the removed sods may be burned in small heaps, and the ashes distributed equally amongst all the tilled squares, or, if the land be tilled in stripes, then the ashes "should be distributed so as to appropriate a due proportion to each plant"; "when the turf is not converted into ashes, it may be placed at the bottom of the tilled part, where it will answer an excellent purpose as manure." "These operations being completed, sow or transplant in the proper season, say, from April to July, the Swedish turnip, cabbage, or mangel-worzel." Before the crop is fed off, the tilled portion of the soil is to be spread over the sward or pasture parts, where it becomes pulverised and fertilised by the treading and manœuvring of the sheep, after which it is to be again drawn back. This system, the inventor says, "will be found very superior and far more economical than any of the modes hitherto practised for tilling and fertilizing all such soils as are not (when tilled in the ordinary way) sufficiently dry in winter for the grazing of sheep, without injury both to them and the land." When the land is tilled under this system in stripes an excellent opportunity is afforded for surface drainage, as a grip or furrow may be made on each side of the tilled stripe.

[Patented Drawing. See London Journal (Newton's), Vol. 15 (conquest series), p. 247.]

A. D. 1839, January 11.—No. 7932.

NEWTON, WILLIAM.—(*A communication.*)—"A machine for drilling or sowing grain or seeds in ploughed land, one particular novelty of which is considered by the inventor to consist in the sowing wheel, whereby the seeds, without the risk of bruising them, may be taken one by one and conducted with uniformity and precision into the furrow made by the progress of the machine as it passes over the land." Rotary motion is given to the sowing wheel by means of an endless band or chain, passed over a pulley, fixed to the axle of the running wheels, but capable of being slid sideways for the adjustment of pulleys of different diameters so as to

preserve a rectilinear direction with the pulley on the axle of the sowing wheel. The sowing wheel is formed of two parts united together, and scooped out in the circumference in the manner shown. "A metallic partition placed between the two portions of the sowing wheel, and extending to the height of the outer periphery of the wheel, prevents the seeds in the channel of one from dropping into the other. On the largest diameter of each of these portions of the wheel are placed at suitable distances apart according to the seed to be sown, small bands of tin, or other suitable material. These take up the seeds one at a time from the box below as the wheel revolves," and carry them along until they arrive at the point where the small hands begin to descend, when the seeds are dropped into a recess formed in the wheel, and are there confined, by a segment and a spring, until they are carried by the revolution of the wheel to the extremity of the segment, when they are dropped into the distributing tube, and are deposited in a ridge or furrow traced by a ploughshare attached to the machine. Harrows and rollers, attached to the hind part of the machine, serve to cover the seed with earth, and to press the ground.

[Printed, &c. Drawing. See London Journal (*Newton's*), vol. 15 (*conjoined series*), p. 65.]

A.D. 1839, March 18.—No. 8004.

CAMPBELL, ALEXANDER FRANCIS and WHITE, CHARLES.—  
"Certain improvements in ploughs."

[No Specification enrolled.]

A.D. 1839, May 30.—No. 8083.

ARMSTRONG, WILLIAM. — "Improvements on harrows." The inventor says, "according to the ordinary construction of harrows, the bars or beams composing the framings into which the tines or teeth are affixed consist of straight bars from end to end of the harrows. Now the object of the first part of my invention is, to construct harrows with bars, which are of a zig-zag figure, by which I am enabled to apply the tines or teeth more advantageously than when affixing them in straight bars one behind the other." The invention is not confined "to any particular dimensions of

" harrows, nor to the number of bends or angles of which each bar " "is composed; but the same may be varied."

Another part of the invention "relates to the mode of obtaining the draught to harrows," by the application of " hooks, or such like instruments, for connecting the harrows to the means of draught or draught beam," in addition to the ordinary hooks or points of draught, one to each harrow; " such additional hooks or means of connection being at each end of the harrows."

Another part of the invention relates to the application of braces, or, in place of braces, a guide, for connecting the draught beam with the horses or other animals.

[Printed, ed. Drawing. See London Journal (Newton's), vol. 12 (containing series), p. 383, Inventors' Advocate, vol. 1, p. 275.]

A.D. 1839, June 12.—No. 8102.

**GROUNSELL, WILLIAM.**—The first part of this invention consists in a mode of constructing drilling machines by applying valves or slides and suitable apparatus for working the same, the object being "to drill corn, grain, pulse, and manure at intervals, and not in a continuous stream, and the intervals or distances apart of such drilling can be varied at pleasure." To the inner side of one of the wheels of a drilling machine is fastened a ring, having a series of studs projecting laterally therefrom, and according to the distance such studs are set apart so will be the closer or wider sowing or drilling of corn, grain, pulse, and manure." An axis turning in suitable bearings in front of the machine has an arm projecting downwards, on the lower end of which "is hinged a curved prolongation in such manner that it may be lifted upwards, and will not be so acted upon by the studs," "as to move the valves in the event of backing the machine; but when the machine is drawn forwards each stud will strike against the projection," and by this means cause the axis to move partly round. Other arms, affixed to this axis, are connected by chains to hooks, the stems whereof are attached by pin joints to arms, or levers, affixed to an axis which moves in bearings below the machine. As these arms carry the drills or coulters and coulters pipes, "the number of such arms will depend on the number of drills used in the same machine." These arms are sup-

ported at their outer ends by chains, by which the depth that the lower end of the drill is permitted to enter the ground is regulated. Levers, each of which, at its lower end, carries the valve or slide that closes the drill, and at its upper end is attached by means of a connecting rod to the stem of one of the hooks, move on fulcrum affixed to the arms. Hence, each time the hooks are drawn forward by the action of the stud ring, the valve or slide will open and allow the seed and manure to pass; it will then close again till the next stud comes into action. "Variations may be made in the details " by which the slides and valves are acted on, in order to " open and close them, so as to sow at intervals; the valves " or slides being suitably arranged to close the drill when " shut, and allow of the grain, corn, pulse, and manure " passing freely when open." The second part of the invention " relates to the mode of supplying the manure to the " tubes," and consists in the application of a wheel which causes the shaft that carries the projecting arms to turn in the opposite way to that now practised, so that the projecting arms on the shaft, instead of acting as hollow ladles, which in the revolution of the axis take up a quantity of manure and throw it over the shaft into the hoppers or funnels leading to the coulters pipe, act simply by their broad concave ends drawing the manure to the hoppers or funnels.

[Printed R.I. Drawing. See London Journal (Newton's), vol. 23 (continued series) p. 258; Mechanics Magazine, vol. 32, p. 225; Inventor's Advocate vol. 1 p. 291.]

A. D. 1839, June 17.—No. 8108.

CAMPBELL, ALEXANDER FRANCIS, and WHITE, CHARLES.

—The invention consists, first, in "a mode of constructing " the beams and fore carriages of ploughs " by causing the beam to move on an upright rod or bar, connected to the fore axle-tree by means of a sliding piece, whilst a chain, affixed to fore part of the beam and passing over pulleys—one of which is carried by an upright rod, and the other by the beam—serves to raise or lower the ploughshare; also the application of a draught chain, "one end of which is hooked to an eye or " pin or collar at either end of the axletree (within the wheels). " In the length of the chain are two screw swivels, by altering " which, and shifting the point of draught from link to link,

"the axletree may be drawn forwards in a position at right angles to the line of the furrows"; the beam being attached to the framing of the plough by means of a crank, which enables the ploughman to adjust the draught with great exactness.

Secondly, in a peculiar construction of wheel to carry the heel of a plough in place of the sole or sledge, which wheel is "formed by the junction of the bases of two frustra of hollow cones," of which the outside or bearing surfaces should form an angle of ninety degrees, whereby the bottom of the furrow will be rolled, and the land side of the furrow will be pressed without its edge being cut, such wheel, having its axletree carried by adjustable conical steel bearings, or, in place of the double cone wheel, a cylindrical wheel may be employed, "when in combination with a land plate and draught crank, and the fore wheel carriage."

Thirdly, in modes of applying suitable pulleys or driving tackle to the axis of the hind or heel wheels of ploughs for working a drill or drills.

Fourthly, in a mode of fastening the shares or blades to Cooke's patent (A.D. 1813) plough-breasts, and the blades to subsoil ploughshares, "by making the share or blade either of steel or iron, the upper face being hardened (by the fusion of prussiate of potash or otherwise), to fit in a rebate or underlap at the front edge (that being the whole width of the furrow), and fastening the share or blade to the rebate or underlap of the breast by a row or rows of rivets in the breast and share"; also in "the use of tension cutters or coulter for ploughs."

Fifthly, in "the mode of applying a vertical wheel at the heel of double-breasted ploughs, and to horse hoes with suitable combinations."

Sixthly, in a mode of constructing subsoil ploughs, by applying the improved fore-carriage in connection with a wheel behind the skife; also in a mode of adjusting the skife by causing it to move upon an axis, so that, by lengthening or shortening a chain, which connects the skife with the fore end of the plough, the inclination of the skife may be varied; also in a mode of adjusting the share, which is pinned to the lower end of the skife, and has a socket at the point, for the purpose of receiving "an angular iron of similar shape pointed

"and hardened for penetrating the soil." The subsoil plough may be converted into a sub-turf plough, "by the use of a two-edged share (instead of the share with one edge) on the skife."

Seventhly, in a mode of constructing drain ploughs. The plough is mounted on three wheels. "The fore arm of the beam is hollow to allow of its motion on the standard." "The plough consists of a central frame, to which the beam is fixed; under the frame is an inclined plane of cast iron leading from the share" "(to which it is rivetted) beyond the end of the breast." "The breasts are capable of movement up and down on the inclined plane, there being proper slots and screws & nuts to fit the breasts to the inclined plane and to the upper part of the skife." "There are two side tennon knives or coulters" "sloping outwards to cut the sides of the drain," and another between them, to divide the soil, and allow it to be thrown to the sides by the breasts.

And, eighthly, in "the mode of combining a series of ploughs on three wheels," the two front wheels being on the fore carriage, and the drag wheel and its frame forming the hind carriage of the machine. The ploughs are bolted in a diagonal line to a beam, which forms part of the plough frame and is suspended from the axle frame by two chains with suitable pulleys and winding tackle. "The object of combining so many ploughs, as before described, on a three-wheel carriage, is with a view to plough a considerable breadth of land at one time, and it may be drawn by power whether from a fixed or other engine, or otherwise."

[Printed, &c. 2d. Drawings. See London Journal (*Newton's*), vol. 18 (continued series), p. 307. *Inventors' Advocate*, vol. 2, p. 19.]

A. D. 1839, August 26.—No. 8207.

PINKUS, HENRY.—"Applying motive power to the impelling of machinery."

This invention consists principally in giving motion to agricultural implements and machinery by "pneumatic atmospheric auxiliary power" and "gaseo-pneumatic power." The implements may be of the ordinary construction, and connected to the engine in a suitable manner, or they may be of certain modified forms. For ploughing, the locomotive



engine is furnished at each end with a set of ploughs, fixed in a diagonal direction to a lever or beam, by which they can be lowered into or raised out of action; one set being in action when the engine is moving in one direction, and the other set when it is travelling in the opposite direction. For harrowing, a circular harrow, a large disc with tines projecting from one side, is fixed in a horizontal position to the lower end of an upright shaft, which is caused to revolve as the engine progresses. If the engine is to be used for digging or excavating, it is furnished with a set of spades, to which the requisite movements are given by excentrics. To pulverise, and sift the soil, there is attached to the engine, in connection with the arrangement for digging, an apron or endless band of wire gauze or other flexible material, extended lengthwise of the engine, and just clear of the ground, between two horizontal rollers, which receive motion from the axles of the running wheels. The spades dig up the earth, and throw it up an inclined plane or grating to the endless apron, which carries it beneath a spiked roller, whereby it is pulverised; and then the pulverised earth is discharged from the apron in a loose state. To collect stones on stony lands, if the meshes of the apron be sufficiently large, the spiked roller may be made to force the earth through the meshes, and the stones will be carried to the back roller and discharged from the apron into a box, or else removed and thrown in heaps. For mowing or reaping, the engine is to be provided with an endless apron, and with a vertical shaft carrying two or more scythes, so that as the shaft revolves, the scythes will cut the grass or grain, which will fall upon the apron, and be discharged at the back of the engine, or it may be gathered from the apron by hand.

[Printed, &c. 2d Drawings. See *Inventors' Advocate*, vol. 2, p. 193.]

A.D. 1839, November 25.—No. 8281.

**HORNBY, RICHARD.**—This invention consists in a seed and manure depositing wheel and its appendages to be applied to all kinds of drilling machines. The seed and manure depositing wheel revolves within the coulters on an axis which passes through one side of the coulters, where it is made the axis of a driving pulley, which is connected by an endless strap with



the last wheel of the gear work, so that as the main cog wheel, which is affixed to the axis of the carriage wheels, revolves along with them, it imparts through lesser cog wheels, the strap and pulley, a simultaneous rotary motion to the seed and manure depositing wheel. The hollow space inside of the depositing wheel is divided into compartments by means of angular projecting pieces, "which are placed in such positions that they shall catch the seed and manure as they issue from the mouth of the supply funnel. The periphery of the wheel is equally divided into a series of doors," which turn on lugs and have springs outside to keep them closed by pressing against "a semicircular ward which is secured by bolts and stays to the coulters and its framework, and so placed that as the depositing wheel revolves, its periphery shall approach so near to the face of the ward that the springs "outside of the doors shall press against it, and so prevent the doors from opening during all the time they are passing the said ward." "As each spring escapes from the pressure of the semicircular ward at the bottom point," the door to which it belongs flies open," "and allows the portion of seed and manure in the compartment immediately behind it to drop into the ground, after which it returns in the course of the upward revolution of the wheel to its original position." The wheel and its appendages may be constructed of any other variety of form not essentially differing from the one here described, and producing substantially the same results.

[Printed, 1s. 6d. Drawings.]

A. D. 1839, December 2.—No. 8294.

NEWBERRY, JAMES WILMOT, and SAUNDER, GEORGE.—

"Improvements in machinery for dibbling or setting wheat, and other grain or seed." The invention relates, first, to the dibbles, "which are arranged around the circumference of a dibbling wheel, those dibbles being arranged in directions radiating from the centre of such wheel, and being hollow within, and adapted to receive wheat, or other grain or seed within their hollows, that seed being introduced (by the means commonly used in drill-sowing machinery) into a central hollow at the nave or centre piece of the dibbling wheel, from which central hollow all the several hollow

" dibles radiate, and are supplied with seed, (in due succe-  
 " sion, as they require,) the outermost ends of the several  
 " dibles which project beyond the circumference of the  
 " wheel being blunt-pointed ends qualified to penetrate into  
 " the ground, without exposing any opening at which the seed  
 " contained within their hollows can drop out until after the  
 " intended penetration has been effected, and then, whilst the  
 " hollow dibble is in the act of withdrawing from the hole  
 " which it has made in the ground, the dibble opens a suitable  
 " passage for the wheat, grain, or other seed to drop out at."  
 " The said opening of the dibble may be effected by making  
 " each dibble in two halves, one half fixed to the dibbling  
 " wheel, and the other half moveable, being adapted to slide  
 " out from the centre of the wheel, so as to expose or open  
 " the hollow within the moveable half, in order to let out the  
 " seed;" the sliding motion is given to the moveable halves of  
 the dibles by means of wheels or trucks, which are applied  
 one to each moveable half of the several dibles, and as the  
 dibbling wheel revolves along the ground, move between two  
 corresponding and parallel rims or borders on a circular plate  
 which "stands edgeways up in a vertical plane close by the  
 " side of the dibbling wheel;" a large portion of each rim or  
 border is circular, but at the lower part it extends further out  
 from the centre than a continuation of the circular curve would  
 do, so that, as the trucks during their circulation between the  
 parallel rims arrive in succession at the curved part, motion is  
 communicated to the moveable halves of the dibles.

The same object may be effected "by making the extreme  
 " end of each dibble in the form of a plug to fit into and stop  
 " the end of the hollow tube of the dibble, and form a blunt-  
 " pointed end thereto; which plug, by sliding out from the  
 " centre of the dibbling wheel, will open a passage for the  
 " seed to drop out at the end of the tube around the plug;"  
 trucks, which are applied to the plugs and circulate between  
 the before-described prominent rims on a circular plate, serve  
 to actuate the plugs in the same way as the moveable halves of  
 the dibles. Another mode is described, whereby each dibble  
 is caused to "turn round after it has penetrated into the  
 " ground, so that an opening at one side of the pointed end  
 " of the dibble may become turned away from a shield, by  
 " which the opening was previously kept closed, in order to

" let out the seed, by exposure of the opening, and also in  
 " order that the dibble may withdraw from the hole which it  
 " has made in the ground with a twisting motion." The turning of the dibble, whereby the opening is removed from opposite the shield, is effected by means of a toothed pinion formed round each tube, which pinions gear in succession with teeth on the before-described circular plate; similar sets of teeth applied on the contrary side of the dibbling wheel serve to turn the dibles back again.

Secondly, to " the mode of applying several dibbling wheels  
 " made by side in one machine, so as that each such wheel may  
 " be urged towards the ground by its own weight, and may be  
 " capable of rising and falling independently of its neigh-  
 " bouring dibbling wheels, in order that each one may accom-  
 " modate itself to small inequalities of the ground."

[Printed, 1s. Drawing. See London Journal (Veston's), vol. 13 (con-  
 joined series), p. 84, Inventor's Advocate, vol. 2, p. 396.]

A.D. 1839, December 24.—No. 8329.

McRAE, ALEXANDER.—"Machinery for ploughing, harrowing  
 " and other agricultural operations." The apparatus is in-  
 tended for British Guiana, where the cultivated land is flat or  
 nearly so, and the fields are separated by navigable canals  
 running parallel to each other. Two punts or shallow vessels,  
 floating in two adjacent canals, are employed; one punt carry-  
 ing a steam-engine which gives motion to a winding drum, and  
 the other a pulley. The ploughs or other implements are  
 connected to a four-wheel carriage figured in the drawing. In  
 this a chain or rope, fastened to the carriage, is passed round  
 the winding drum; it is thence led across the field and over  
 rollers on the under part of the carriage to the pulley in the  
 second punt, and after passing round this pulley it is carried  
 back to the carriage and secured thereto. After each traverse  
 of the carriage, the punts are moved along the canal a suitable  
 distance to allow the implements to act upon a fresh portion of  
 the field. In the drawing the carriage is furnished with two  
 sets of ploughs to work in opposite directions, one set being  
 apparently raised and the other set lowered into action at the  
 end of each traverse. Where the land is not perfectly level,  
 this apparatus is not to be used, but the power of the engine  
 is to be applied "by means of the same machinery directly to

" all sorts of agricultural implements usually worked by horses  
" or other animal power."

[Printed and Drawing. See Repertory of Arts, vol. 11 (main series), p. 312;  
London Journal (Newton's), vol. 22 (continued series), p. 431; Inventors'  
Advocate, vol. 3, p. 3.]

A.D. 1840, February 25.—No. 8397.

HUCKVALE, THOMAS.—The first part of this invention  
" relates to a mode of constructing ploughs with double  
" shares, so formed that each portion of the share at one time  
" acts as an ordinary share and at other times as a coulter;  
" each double share moving with a mould-board on an axis,  
" whereby in using such ploughs the earth of the furrow will  
" be moulded or thrown in the same direction in proceeding  
" up and down the field." A peculiar kind of whippie-tree is  
shown and referred to, but is not claimed as part of the inven-  
tion. Another part of this invention " relates to the construc-  
" tion of a share, which performs at once the operation of  
" share and coulter," thereby dispensing with the use of the  
" ordinary coulter, but the use of this construction of share  
is not claimed when used in conjunction with an ordinary  
coulter for draining purposes. Another improvement " relates  
" to a mode of applying the shoe or foot to ploughs, by which  
" the heel and mould-board may be raised or lowered to give  
" the necessary pitch or dip to the plough." The shoes or  
feet applied to the heel of the plough and mould-board turn  
on axes at one end, and are " raised or lowered by a screw or  
" other means applied to the other end." Another improve-  
ment in ploughs " relates to a mode of levelling land." To  
an axle carried by two wheels and furnished with shafts for a  
horse is attached, by means of hooks and eyes, a share or blade  
" by which the mould is collected and afterwards deposited in  
" the furrows." The share or blade extends parallel to the  
axle nearly the whole distance between the two wheels. There  
are handles " applied to the share or blade, which are held by  
" the ploughman, and by which he is enabled to regulate the  
" quantity of mould required." The next and last improve-  
ment relates to a pairing plough, and that is so constructed  
that the three first shares, when cut by three front shares, are  
*turned over on the three slices which will be cut by three*  
*shares that follow.* " The work when completed will be left

" in ridges, with the sword sides of the slices facing each other."

[Printed by Drawings. See Repository of Arts vol 14 (new series), p. 206; London Journal, Nov. 8/4, vol 15, continued series, p. 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000]

A. D. 1840, March 25. — No. 8450.

HAY, JAMES. — An "improved plough" is so constructed that it "may be worked in opposite directions without turning the body." The improved construction is effected by fixing to the body itself two mould boards on the same side of the plough and likewise two shares, one on each extremity of the body, whose fenters or cutting part lies on the same side as that of the mould boards, and in fitting to the body handles, a beam, and bridle with the coulters, which handles, beam, bridle, and coulters may, by the construction, be together turned in opposite directions without turning the body. The handles, beam, bridle and coulters, forming together one piece of framework, revolve horizontally upon a joint or bolt, which is fixed in the middle of a bar at the upper part of the body of the plough. When the plough is to be drawn forward, this framework is fixed and prevented from revolving horizontally by "glands" jointed to the beam and embracing the ends of the bar beneath it; the after and foremost glands being connected together by a rod to which they are attached by means of bolts, and to this rod is attached another rod which proceeds backwards to within reach of the ploughman, where it terminates in a handle. By pulling this handle back, the glands are unlocked, and the beam can then be turned round on its joint or bolt so as to reverse its direction; then by pushing the handle forward the glands are locked, and the plough is ready to be drawn in the opposite direction. The mould boards "ought to be clasped firmly together when they meet by any of the ordinary methods." The bar which supports the beam has two arms extending downwards to the sole bar, where each terminates in a palm, where they are bolted. The bar is extended sufficiently beyond its two arms for the glands to lock into the projecting parts, and the sole bar is also prolonged backward and forward to form the arms in which the shares are fixed. "The land side of the plough is formed in two vertical planes, the one

"inclined to the other" "forming an angle of one hundred and seventy-six degrees, which angle, however, may be varied" "as found convenient."

[Printed *ad. Drawing*. See London Journal (*Newton's*), vol. 21 (conjoined series), p. 410. *Inventors' Advocate*, vol. 3, p. 213.]

A. D. 1840, April 16.—No. 8480.

COOPER, ROBERT.—Ploughs. The plough described is for cutting trenches or drains. It is mounted on two pairs of wheels. The hinder axle has on it a crank to which the beam is attached, and a worm and worm wheel, by which the axle may be revolved and the crank thereby set at any angle to raise or lower the beam, &c. Each wheel also may have a separate cranked axle, so that the wheels can be set at different levels to enable the plough to work on the side of a hill. The fore axle is attached to the beam by a screw, so that the beam can be raised and lowered. There are bars which act as stays to support the beam when raised or lowered. Immediately behind the fore wheels a pair of rotary cutters is fitted; behind these is a pair of fixed coulters. The stems carrying these are all adjustable as to height. Behind the coulters is a "sledge" with a front cutting edge, and an inclined surface up which the soil slides. At the sides of this are plates, corresponding to the coulters. These and the inclined surface are so arranged as to guide the soil and deliver it at the side. The plough is guided by handles behind, and drawn by a chain from a capstan. Shafts may be fitted to it for drawing it along roads, &c.

[Printed, *1s. ad. Drawings*. See London Journal (*Newton's*), vol. 21 (conjoined series), p. 412. *Inventors' Advocate*, vol. 3, p. 230.]

A. D. 1840, May 12.—No. 8506.

BRADSHAW, PETER.—The invention consists, firstly, in the mode of applying certain instruments to form holes in the ground in combination with suitable apparatus for dropping corn or seed into the holes so formed. On an axis, to which motion is communicated from the running wheels, are affixed a series of eccentrics, each of which is embraced by a frame—and each frame has a hole through which a rod passes having "an enlarged and pointed end," which being caused to enter and leave the land, produces a hole. The rods are retained in their places by means of a spring attached to each frame,



which springs the inventor prefers to be "of such a strength  
" that they will not be overcome by the simple pressure in  
" causing the pointed ends of the rods to enter the earth."  
Each rod passes through a ring or guide formed bell-mouthed,  
as regards the upper and under sides, in order that the rod  
may assume an angular position, a number of these guides or  
rings in proportion to the number of rods being affixed to a  
bar which is fixed across the machine. "In order to obtain  
" the requisite rotatory motion of the rods that their pointed  
" ends may leave the holes formed thereby without causing  
" the ground to be broken up, projecting arms are applied,  
" one to each rod, and to each arm is applied a connecting rod  
" by a pin joint, such connecting rods moving in front " on  
axles in fixed bearings; hence, "in the movement of the rods  
" up and down by the excentrics and the angles they conse-  
" quently take in respect to the guides or rings, they will, by  
" means of the connecting rods, cause the pointed ends of the  
" rods to perform a portion of a rotation in entering and also  
" in leaving the ground." Although the inventor prefers "to  
" use excentrics for raising and lowering the rods, and the  
means described for giving to the rods a partial rotation, he  
does not confine himself thereto, as "the same movements  
" may be obtained by substituting equivalent mechanical  
" instruments for obtaining such movements."

Secondly, the invention consists in the mode of dropping  
grain or seed at intervals apart by means of a roller and its  
box. The seed box, which is as wide as the machine, is  
attached to side frames descending from and affixed to the  
frame of the machine. At the lower part of this box is an  
opening, which is exactly closed by a roller, the axes of which  
turn in bearings at each end. "In order to cause grains of  
" seed to fall into the holes made by the instruments, there  
" are recesses formed around the roller at such distances apart  
" as to cause seed to be dropped exactly over the holes formed  
" successively by each of the rods; and as the rods do not go  
" down all at one moment, but succeed each other, owing to  
" the manner of placing the excentrics, the holes in the roller  
" are not in a direct line, but succeed each other, to correspond  
" with the working of a particular rod." There is a brush  
placed opposite each row of recesses round the roller, by  
which any excess of seed in the recess, and also any injury to



the grains of seed from being crushed, is prevented. Motion is communicated to the roller by means of an endless chain, which connects a wheel on the roller with another wheel working on an axle, which derives motion from the running wheels. When it is required to apply manure together with the seed into the same holes, a second apparatus is used in every way similar to that described for receiving and sowing seed.

(Printed, 2s. Drawings. See *Inventors' Advocate* vol. 3, p. 322.)

A. D. 1840, May 28.—No. 8517.

CAMPBELL, ALEXANDER FRANCIS, and WHITE, CHARLES.—The invention relates, first, to subsoil and subsoil ploughs, and consists in attaching to the iron axle of the wheels of the fore carriage a vertical rod, which "forms the centre or perch" "bolt on which the fore carriage turns" in a socket on the fore end of the beam; a side rod, the lower end of which is attached to the same axle by means of a joint, whilst its upper end slides through a ring attached to the vertical rod, admits of the vertical rod and the plough being "held in a vertical" position, whether the fore wheels run on the side of a hill or "that one wheel runs below the other in a furrow." These improvements enable the inventor "to dispense with the" means described in the Specification of a former Patent "for raising the fore part of the beam, by the omission of the" pulley and lifting gear," "and also to apply a hind wheel" without its axle being carried in a dray frame, or frame "moving on an axle as formerly described."

Secondly, the invention consists in "the mode of applying" "an axle" "in combination with a hind wheel, and a fore" "carriage or wheels to hoes;" such wheel is capable of adjustment in reference to the beam, to which the frame of the hoe is attached by means of a pin joint; the movement at the joint allowing the hoe share and blades to be raised out of work, and also the depth at which the hoe shall work to be regulated. Another improvement consists in "the mode" "of constructing hoes by employing tension blades," which "are fixed to a pointed iron by dovetailed pieces or otherwise," "and are strained or stretched backwards and outwards," and fastened to a cross bar by couplings and set screws. Another improvement consists in "the mode of applying the" "draught to a point behind the fore wheels carriages of

"hous and ploughs, such draught being independent of the  
 "fore carriage laterally, and for the purpose of steerage,"  
 "when the beam has no joint to move laterally."

Thirdly, in "the mode of constructing ploughs by applying  
 "tension blades as shares."

Fourthly, in "the mode of constructing ploughs, by applying  
 "lever handles to steer such ploughs, to the fore parts or  
 "beams of ploughs, when such fore parts or beams are capable  
 "of lateral movement in respect to the working parts of  
 "ploughs, the fore carriage being the fulcrum of such leverage."

Fifthly, in "the mode of constructing ploughs, by applying  
 "axes" "(in combination with fore and hind wheels) for  
 "adjusting the position of the shares;" the centre of the  
 plough frame is attached to a bearing iron, connected to the  
 beam by an upright axle and horizontal joint. By elevating  
 the handle of a lever the horizontal joint will also be lifted,  
 and "at the same time it will give movement, so that the share  
 "and working parts will describe an arc upwards on the under  
 "surface of the hind wheel."

Sixthly, in "the mode of constructing ploughs by the appli-  
 "cation of" "draught irons capable of lateral movement;"  
 such draught iron connects the horizontal joint, described  
 under the fifth head of the invention, with the working parts,  
 and is used in connection with single furrow ploughs "for the  
 "purpose of obtaining a point of draught where the pressure  
 "may be equal."

Seventhly, in the mode of applying the axis of a wheel com-  
 posed of two truncated cones, for the purpose of running in  
 the furrow at the heel of the plough; such axis has its ends  
 turning in bearings in moveable pieces, and "forms a brace to  
 "connect the mould iron with the land plate;" or, in place of  
 the double cone wheel a cylindrical wheel may be used with a  
 plough containing any of the other improvements. Modes  
 of attaching tension coulters to ploughs are also described.

Eighthly, in "the mode of constructing a turn or reversing  
 "plough by means of two ploughs placed one over the other  
 "and carried on a hind wheel, together with a suitable fore  
 "carriage."

Ninthly, in "the mode of constructing drain ploughs, with  
 "the application of joints" "(in combination with fore and  
 "hind carriages on wheels and not on sledges) for the pur-

"pose of adjusting the position of the share;" and also in the mode of "applying a rack with suitable adjuncts" for regulating the position of the joint, and also for lifting the plough-frame out of work.

Tenthly, in the mode of constructing and applying pendant guide frames to a series of ploughs, combined with these improvements; the pendant frames, which form the medium of attachment for the plough-frame and working parts, have liberty to turn on screw bolts, whereby they are attached to radial irons, "whilst they have bearings on the arcs of the radial pieces respectively," which radial irons are fastened to slots at each end of the axle frames, so, as to be capable of lateral adjustment; axle arms which carry the fore wheels have their inner ends connected by studs on the axle arms, having liberty for movement in slots formed in a centre bar, which turns in a pivot in a central socket, whereby the axle-frame with plough-frame attached may be steered, such method of steering being called "steering on two centres of the fore carriage of ploughs."

Printed, &c. Drawings. See London Journal (Newton's), vol. 18 (continued), p. 205. Inventor's Advocate, vol. 4, p. 56.

A.D. 1840, July 11 — No. 8567.

**PALMER, WILLIAM.**—"Certain improvements in ploughs,"  
 "designed to reduce the friction of draft to enable the plough  
 "to accommodate itself to any required depth of cutting, and  
 "to afford a more certain and accurate means of directing its  
 "course. These objects are effected by dispensing with the  
 "sole or slide, and causing the lander part of the plough to  
 "be supported by and run upon a wheel behind the breast."  
 This running wheel is attached by a pin or axle to a saddle iron, from the upper part of which a perpendicular pin extends, having a worm or screw cut round it; this perpendicular pin passing through an aperture in the bridge affixed to the beam and to the handles, is held up, together with the saddle iron and wheel, and can be raised or depressed, and consequently the depth to which the share shall cut into the ground will be regulated by means of a screw nut above. The bracing is a plate of iron having three arms, the upper two of which are fixed to the beam and to the handles, and to the lower arm is a long slot, through which the axle of the wheel passes. The

hake at the end of the beam is formed by a frame, which carries two perpendicular pins, which pass through a socket piece, to which the draft chain is attached, one pin being smooth to allow the socket piece to slide freely upon it, whilst it is held in its position by the other, which has a worm or screw thread cut round it. Hence, by turning the screw pin, the drag chain will be raised or depressed, and the position of the draft will be regulated. "The coulter" "has a wedge-shaped cutting blade at its lower part, and is cylindrical above, which is inserted into a cylindrical socket on the side of the beam. This socket forms the end of a bolt passed through the beam and through two disc plates, and at its reverse end there is a winch nut, which being turned draws the coulter and the discs tight against the beam. This mode of fixing the coulter allows it to be placed at any desired depth. The inner disc plate" "is loose upon a pin, and is capable of being turned round. It is made thicker on one side than on the other; that is, its sides are not parallel, but of a wedge form, hence, by turning the inner disc plate" "round, the direction of the cutting part of the coulter may be varied so as to suit the angle of direction required."

*Printed, and Drawn. See Repertory of Arts, vol. 15 (new series), p. 211, London Journal (Newton's) vol. 10 (discontinued series), p. 117. Mechanic Magazine, vol. 34, p. 45. Inventors Advocate vol. 4, p. 51.]*

A. D. 1840, August 3.—No. 8587.

SANDERS, JOHN, WILLIAMS, WILLIAM, and TAYLOR, SAMUEL LAWRENCE.—"Improvements in ploughs." This invention relates to certain modes of applying and adjusting the coulter, which have for their object means of adjusting, first, the distance of the coulter from the beam of the plough, and, secondly, the inclination of the coulter. First, the coulter is applied to the beam by means of a frame plate, which moves on an axis or bolt passing through the beam, and by means of a set screw which passes through a fixed nut and rests against a projection from the frame plate, the angle of the coulter may be adjusted.

Another mode is described wherein, the frame plate being dispensed with, the projecting plate moves on an axis or bolt, and has a bent plate formed thereon, which carries a plate,

"pose of adjusting the position of the share;" and also in the mode of "applying a rack with suitable adjuncts" for regulating the position of the joint, and also for lifting the plough-frame out of work.

Tenthly, in the mode of constructing and applying pendant guide frames to a series of ploughs, combined with these improvements; the pendant frames, which form the medium of attachment for the plough-frame and working parts, have liberty to turn on screw bolts, whereby they are attached to radial irons, "whilst they have bearings on the arcs of the radial "pieces respectively," which radial irons are fastened to slots at each end of the axle frames, so, as to be capable of lateral adjustment; axle arms which carry the fore wheels have their inner ends connected by studs on the axle arms, having liberty for movement in slots formed in a centre bar, which turns in a pivot in a central socket, whereby the axle-frame with plough-frame attached may be steered, such method of steering being called "steering on two centres of the fore carriage of "ploughs."

(*Penetration, Drawings.* See London Journal (*Newton's*), vol. 18 (*composit*), p. 305, *Inventor's Advocate*, vol. 4, p. 500.

A. D. 1840, July 11.—No. 8567.

**PALMER, WILLIAM.**—"Certain improvements in ploughs,"  
 "designed to reduce the friction of draft to enable the plough  
 "to accommodate itself to any required depth of cutting, and  
 "to afford a more certain and accurate means of directing its  
 "course. These objects are effected by dispensing with the  
 "sole or slide, and causing the hinder part of the plough to  
 "be supported by and run upon a wheel behind the breast."  
 This running wheel is attached by a pin or axle to a saddle  
 iron, from the upper part of which a perpendicular pin extends,  
 having a worm or screw cut round it; this perpendicular pin  
 passing through an aperture in the bridge affixed to the beam  
 and to the handles, is held up, together with the saddle iron  
 and wheel, and can be raised or depressed, and consequently  
 the depth to which the share shall cut into the ground will be  
 regulated by means of a screw nut above. The bearing is a  
 plate of iron having three arms, the upper two of which are  
 fixed to the beam and to the handles, and to the lower arm is a  
 large slot, through which the axle of the wheel passes. The

hake at the end of the beam is formed by a frame, which carries two perpendicular pins, which pass through a socket piece, to which the draft chain is attached, one pin being smooth to allow the socket piece to slide freely upon it, whilst it is held in its position by the other, which has a worm or screw thread cut round it. Hence, by turning the screw pin, the drag chain will be raised or depressed, and the position of the draft will be regulated. "The coulter" "has a wedge-shaped cutting blade at its lower part, and is cylindrical above, which is inserted into a cylindrical socket on the side of the beam. This socket forms the end of a bolt passed through the beam and through two disc plates, and at its reverse end there is a winch nut, which being turned draws the coulter and the discs tight against the beam. This mode of fixing the coulter allows it to be placed at any desired depth. The inner disc plate "is loose upon a pin, and is capable of being turned round. It is made thicker on one side than on the other; that is, its sides are not parallel, but of a wedge form, hence, by turning the inner disc plate "round, the direction of the cutting part of the coulter may be varied so as to suit the angle of direction required."

(Printed, &c. Drawing. See Repertory of Arts, vol. 13 (new series), p. 211; London Journal (Newton's) vol. 10 (continued series), p. 117; Mechanic Magazine, vol. 34, p. 45; Inventors' Advocate vol. 4, p. 51.)

A.D. 1840, August 3.—No. 8587.

SANDERS, JOHN, WILLIAMS, WILLIAM, and TAYLOR, SAMUEL LAWRENCE.—"Improvements in ploughs." This invention relates to certain modes of applying and adjusting the coulter, which have for their object means of adjusting, first, the distance of the coulter from the beam of the plough, and, secondly, the inclination of the coulter. First, the coulter is applied to the beam by means of a frame plate, which moves on an axis or bolt passing through the beam, and by means of a set screw which passes through a fixed nut and rests against a projection from the frame plate, the angle of the coulter may be adjusted.

Another mode is described wherein, the frame plate being dispensed with, the projecting plate moves on an axis or bolt, and has a bent plate formed thereon, which carries a plate,



through the upper part of which the set screw passes, and by resting against the beam determines the more or less vertical position of the coulter; this plate has a slot formed therein, through which a screw passes, by which it can be affixed to the beam at any desired position.

Another mode is described, in which the coulter is applied to the beam by means of a sliding socket, the coulter being made fast to a projecting angular-faced plate by means of a clamp; such clamp consisting of a plate bent at right angles at top and bottom, and having two recesses formed therein, and two set screws with their nuts, by means of which the more or less vertical position of the coulter can be regulated.

Another mode is described, in which the before mentioned socket, in addition to being able to slide along the beam, and be affixed thereto by a screw, has also the capability of rocking thereon, owing to the figure of the socket, by which and by the set screw the inclination of the coulter can be regulated.

A mode is described in which the coulter is caused to stand out at an angle more or less from the beam by means of a sliding plate and two set screws, the sliding plate having a recess formed therein to receive the stem of the coulter.

Secondly, in order to adjust the distance of the coulter from the beam, the stem of the coulter is made to pass freely through a clamp, and it is there fixed by means of a screw, which passes through the back of the clamp, and rests against a projecting plate, forming part of and being a projection at right angles to the face of the frame plate, such projecting plate having a dovetail projection on which a plate suitably formed at the back to move on such dovetail surface, its front being concave to receive the stem of the coulter, moves to or from the beam of the plough.

The patentees lay no claim to any of the parts separately, nor do they confine themselves to the precise form thereof so long as the peculiar character of the invention be retained.

Printed by J. G. Thompson, at the Office of the American Patent Office, No. 115, Broadway, New York. See Report of the American Patent Office, vol. 1, p. 270. The American Patent Office, vol. 1, p. 270. The American Patent Office, vol. 1, p. 270. The American Patent Office, vol. 1, p. 270.

A. D. 1840, October 22.—No. 8065.

**EDMUNDS, RICHARD.**—“Certain improvements in machines or apparatus for preparing and drilling land, and for de-



"positing seeds or manure therein." The invention consists, firstly, in constructing "a machine for pressing and preparing land for receiving corn, grain, seeds, or manure in which a number of pressing rollers are employed, each roller being mounted on separate axles, so that they may yield to any inequality in the surface of the ground," these separate axles turning in bearings in the ends of levers having their fulcrums in a cross bar or other part of the framework of the machine." The invention relates also to that description of pressers or rollers which "are constituted of separate cylindrical 'pressers' or 'rollers,'" and consist of a series of wheels with plain peripheries revolving separately.

Secondly, in improved arrangements for regulating the supply of seed or manure to the conductors or depositors of drilling machines, wherein the size of the apertures in the hopper, through which the seed escapes, is regulated by means of a metal plate, which slides in grooves formed by studs or projections, which are attached to the hopper. To one end of the metal plate is connected a screw, which turns in a female screw fixed to the hopper, and, when the screw is turned, the metal plate is moved either backward or forward, and all the apertures through which the seed escapes are increased or diminished in size simultaneously. The invention relates also to a mode of propelling and guiding "hand-drilling machines" by means of two rods, one of which is connected "to one end of the machine just behind the wheel, and at right angles to the axle thereof, and the other rod at the other end of the machine about the angle of 45 degrees to the first," so that the driver is enabled to propel the machine, and guide it in its proper course by looking at the wheel that is before him and keeping it in the furrow.

Lastly, in an improved construction of drilling machines, wherein notched wheels mounted on a common spindle, having at its end a small pinion, which takes into gear with a driving wheel on the axle of the running wheels, take up the end as it passes out through an aperture in the hopper, and as they revolve drop the seed into the furrows. The quantity of seed that is taken up by each notched wheel is regulated by means of moveable side pieces, connected to a "sliding bar," which "is moved backwards and forwards by means of a screw in the same manner as the metal plate" previously described,

and causes all the apertures, through which the seed passes from the hopper, to be increased or diminished in size simultaneously.

[Printed, 1s 6d. Drawings. See London Journal (*Newdon's*), vol. 19 (continued series), p. 367. *Mechanics Magazine*, vol. 33, p. 367. *Inventors' Advocate*, vol. 4, p. 277.]

A. D. 1840, November 2.—No. 8668.

DUNCAN, JOHN.—(*A communication.*)—"Machinery for cutting, reaping, or severing grass, grain, corn," &c.

The apparatus is arranged to be drawn by a horse in shafts so placed that the cutting apparatus is at one side beside and slightly behind the horse, the back of the machine consisting of a platform on which the cut crop falls. The cutting apparatus consists of a revolving conical drum on a vertical axis, round the base of which are arranged curved blades. Below these is a row of fingers or points which enter the corn and guide it to the cutters. There are also guides at each side for the same purpose. The cut crop is carried round by the revolving cone, which has arms on it for the purpose, and delivered on the platform behind, being received by fixed arms arranged for the purpose. It may be delivered thence by an endless band, or it may be removed by hand, or made up into sheaves on the platform. The whole apparatus is actuated by gearing from one of the wheels.

[Printed, 6d. Drawing. See *Mechanics Magazine*, vol. 34, p. 308. *London Journal (Newdon's)*, vol. 23 (continued series), p. 19. *Inventors' Advocate*, vol. 4, p. 294.]

A. D. 1840, December 30.—No. 8760.

HENSMAN, WILLIAM.—This invention "relates to a mode of applying coulters of ploughs, in order to obtain more ready means of adjustment in respect to the beams of ploughs." A "projection" is "formed or affixed on the beam, and becomes the fulcrum or surface on which the coulters move in adjusting the point of the coulters to or from the land side of a furrow." The coulters are held tightly to the beam by means of eye bolts, which passing through a plate, which plate partly embraces the beam, have nuts screwed on, and, according as the screw nut on the upper or lower eye bolt is more or less tight in respect to the other, so will be the more or less forward position of the point of the coulters. Another mode of applying coulters is described, wherein the

projection, in place of being on the beam, is on a plate, which is applied on one side of the beam of a plough, and the lower eye bolt, in addition to holding and adjusting the coulter on the plate, has its stem to pass through the beam, and thus allows the plate to move thereon as on an axis. An adjusting screw is attached by a pin joint to the plate, and passes through a projection formed or affixed on the beam, so that, by means of a screw nut, the point of the coulter may be set forward or backward. By this arrangement "the coulter can be adjusted " in two directions, that is, to and from the land side of the " furrow, by means of the eye bolts and screws," and to and from the fore part of the plough, by means of the plate with its screw and nut.

[Printed by Drawing. See Repository of Arts, vol. 17 (new series), p. 75; London Journal (Newton's), vol. 22 (new series), p. 432; Mechanics Magazine, vol. 35, p. 39; Inventors' Advocate, vol. 5, p. 21.]

A. D. 1841, January 14.—No. 3784.

**HALL, JOSEPH.**—"Seed and dust disperser, which is particularly applicable to the freeing of corn and other plants from insects."

Two modifications of the apparatus are described (1), for supplying "dust," such as lime, &c. to growing plants, (2) for sowing seed and "dust."

1. The dust box is mounted in a two-wheeled carriage. It is fitted with tubes leading to the ground. In each tube is a wire stirrer to which movement is given by a slight cranked shaft along the top of the box. A bellows is also fitted in the carriage, and worked from a crank driven from the running wheels. From the bellows a number of tubes corresponding to the dust tubes lead to the ends of the latter, and drive the dust through funnels on to the plants.

2. The dust-box and bellows are replaced by a double box with compartments for seed and dust. Cup-wheels revolve in each and deliver into funnels leading to the ground. Below the carriage is a swinging frame, segment shaped below. To this coulters are attached, each coulter being slotted to allow the end of a seed tube to be fitted therein. Behind the coulters are rakes, and behind these a roller. The latter part of the apparatus may be used as a harrow, scarifier, or roller.

[Printed by Drawing. See London Journal (Newton's), vol. 22 (new series), p. 431; Mechanics Magazine, vol. 35, p. 62; Inventors' Advocate, vol. 5, p. 52.]

A. D. 1841, February 15.—No. 8844.

SMITH, THEOPHILUS.—“Certain improvements in ploughs,” whereby the depth or breadth of the furrow may be varied. The improvements applicable to a fen, and also to a swing plough, consist in connecting the inner extremity of the hake with a handle within reach of the ploughman, by means of a lever centred on a fulcrum, and working in a guide frame, wherein it can be fixed in any desired position for the purpose of regulating the depth of the furrow; or in place of the lever a bell-crank lever may be used, one arm whereof is jointed to the inner extremity of the hake, whilst the other works in a guide frame, and has a handle attached to it. The improvements whereby the plane of the plough may be set at any convenient angle to the line of draught, as applied to a swing plough combining the before-described improvements, consist in making the beam jointed at the end so as to move vertically upon a centre, whilst the upper hake-iron, having the drag chain attached, carries a toothed rack or segment, which gears with a pinion connected with a handle by means of a shaft and universal joint; or when the beam is not jointed the drag chain may be attached by means of a coupling piece traversing freely upon the hake, such coupling piece being attached to one end of an iron bar turning upon a centre, and having at its other end a toothed rack, which gears with a pinion attached to a shaft and handle. The improvements, as applied to wheel ploughs, consist in causing the beam to be supported at its further end by a roller fixed on a cross rail of a frame or gallows, which is mounted on two wheels and drawn by a drag-chain, such frame being affixed to the plough-beam by means of a chain and also by a bar, one end whereof is bolted to the top rail of the frame whilst the other end is pinned to a lever which works in a guide frame, and by means of which the depth of the furrow may be regulated; or in place of the arrangement of levers, the position of the frame may be altered by means of a screw and traversing nut, supported by a universal joint on the top of the frame. The same object may be effected by means of the beam being jointed and caused to turn upon a centre pin, the inner end of the jointed portion of the beam being actuated so as to regulate the depth of the furrow by a lever, or a bell-crank lever, or else by a screw and traversing nut. The frame or gallows may be constructed to

carry a horizontal toothed rack gearing with a pinion, the axle of which is connected by a universal joint to a shaft having a handle attached, whereby the frame may be caused to traverse to the right or to the left, and the required deflection thereby given to the body of the plough; or in place of the rack and pinion a pulley and chain may be used for traversing the frame.

[Printed, 1s. Drawings. See *Mechanics' Magazine*, vol. 35, p. 177. *Inventors' Advocate*, vol. 5, p. 117.]

A.D. 1841, May 20.—No. 8962.

**PHILLIPS, CHARLES.** — Reaping machines, &c. Besides a reaping machine a root-cutter and a chaff-cutter are described.

In the reaping machine a set of fingers guides the crop to rotating circular cutters on vertical spindles; these are arranged in pairs so as to form "rolling shears." The cutters of each alternate pair are driven by toothed gearing from a transverse shaft behind, and these drive the cutters of the other pairs by pinions on the spindles of both. Above the cutters is a horizontal shaft with radial arms carrying boards which as they revolve deliver the cut crop on to an endless travelling web, which carries it to a platform behind. On each side in front are projecting rods with fabric stretched thereon to act as guides. The whole apparatus is driven from one of a pair of wheels on which it is supported. It may be pushed forward by a man behind, or drawn by a horse harnessed at the side.

[Printed, 1s. 10d. Drawings. See *Mechanics' Magazine*, vol. 35, p. 467. *Inventors' Advocate*, vol. 5, p. 343.]

A.D. 1841, May 25.—No. 8968.

**BHAM, WILLIAM LEWIS.** — "Improvements in machinery or apparatus for preparing land and sowing or depositing grain, seeds, and manure," which "consist in the peculiar construction of a machine suited to the performance of the several operations of preparing the surface of the soil, dibbling the ground for the reception of seeds, and of depositing seeds and manure in the dibbled holes with certainty and regularity." Long curved levers, which carry a crank axle designed to work the dibble, hang upon a shaft at the hinder part of the frame, and are braced together in front by bars; which bars are also employed to hold angular shoes or

pressers, which "precedes the dibbles for the purpose of working " the soil and producing a smooth furrow." The crank axle, through its connection by a train of toothed gear to the axle of the running wheels, is caused, as the machine passes over the ground, to revolve in an opposite direction to that of the running wheels, and in so doing, through the agency of rods, which extend from the several cranks on the axle, to raise and depress successively small levers, each of which is connected at its end by a joint to the upper part of one of the vertical shafts of the dibbles; hence, by this action, the dibbles are forced down into the ground and lifted up after having made the dibble holes. A strap piece, having a forked end, is used to connect the dibble shaft and the crank rod together, and to allow a small degree of vibratory action or play to the shaft of the dibble in the forked end of the strap, which is supported and regulated by the elastic force of a spring affixed to the shaft of the dibble, and acting against the end of the forked strap. The bulb or point of the dibble is formed at the bottom of a tubular socket, into which is inserted the lower part of the dibble shaft. At the upper parts of the tube or shank there are cross arms, "one of which arms (whilst the dibble is " stationary in the ground), by the forward progress of the " carriage, is acted upon by a little curved tappet pin," fixed in a horizontal guide plate, which tappet pin, by striking against the arm as the carriage advances, causes the shank of the dibble to be turned one quarter round, whereby smoothness is produced in the dibble hole. The seed hopper is contracted at bottom, and its lower aperture is closed by a tumbler valve, which is a cylinder having a small recess, and which is made to turn upon its axis by means of a rod, connected at one end to a crank on the end of the axle, and at the other end to a moveable shield which encloses the spout. The working of the shield and tumbler valve is effected by a rod, attached at one end by a socket and point to the shank of the dibble, and at the other end by a joint to the moveable shield. As the dibble vibrates, the shield will be made to move upon its joint pin, and to bring round the tumbler valve, and so cause the seed held in its recess to fall into the spout: which seed, however, will not pass through the spout until "the dibble comes " to its vertical or quiescent situation in the ground," when the shield will be thrown back, "and the seed be pushed by



" the lower part of the spout through the aperture at bottom  
" into the hole in the ground made by the preceding opera-  
" tion of the dibble." " Behind the seed hopper a similar  
" hopper and valve of larger dimensions is placed for the  
" delivery of manure." The moveable shield of the manure  
hopper is worked by a rod connected to the shield of the seed  
hopper; consequently, as the seed is deposited through the  
seed spout by its shield in one dibble hole, the manure is  
pushed out by its shield "in a similar way into the dibbled  
" hole previously supplied with seed." The depth to which  
the dibble shall be allowed to penetrate into the ground may  
be regulated by means of a handle and longitudinal shaft on  
the side of the machine; this shaft having a bevel pinion upon  
its end taking into a corresponding pinion on the end of the  
transverse bar of another pinion, which takes into segment  
racks on the edges of arms on the levers which carry the crank  
axle designed to work the dibles. The levers and their  
appendages are held fast, and the dibles kept at their desired  
height by a ratchet and catch. The centres of the shaft,  
whereon these levers hang, of the driving wheel, and of a  
connecting pinion, being nearly in a line, a small degree of  
elevation and depression of the levers is allowed without  
throwing the driving wheel and pinion out of gear; but if the  
levers are raised beyond a certain height, the pinion " will be  
" drawn away from the teeth of the driving wheel, when the  
" operating parts of the machinery will be raised from the  
" ground, and their evolutions immediately stopped." A  
series of forked rakes are attached behind the manure hopper,  
for the purpose of covering the seeds and manure with earth,  
and after these a roller is made to follow, for the purpose of  
pressing the ground. The steering of the carriage is effected  
by turning, by means of a handle, a horizontal shaft extending  
over the machine, which shaft carries an endless screw, which  
acts upon a toothed wheel keyed at the top of the axle of two  
small fore wheels, and thereby steers or inclines the position of  
the shaft of these wheels, according to the direction desired to  
be given to the carriage. The improved construction of feed-  
ing valves may be adapted to any common drill; also, by  
attaching other tools in place of the shoes or pressers, the  
machine may be converted into a scarifier, scuffler, or hoe. A



peculiarly formed tool represented in the drawing "may be applied with great advantage as a harrow line, or as a coulter to a plough."

(Printed, in Drawing, *New London Journal* (Apostrophe), vol. 20 *London and Essex*, p. 41. *Mechanics Magazine*, vol. 52, p. 32. *Inventors' Advocate*, vol. 5, p. 397.]

A. D. 1841, June 10.—No. 8982.

BENTALL, EDWARD HAMMOND. "Certain improvements in "ploughs," which consist, first, in a mode of applying an adjustable lever, having the share attached by a bolt to its end or nose, by a transverse groove cut in the under part of the lever bearing upon a ridge or fulcrum, which is formed upon the frame, whilst the upper part of the lever is connected to the frame by a screw bolt, having nuts upon it, by means of which the nose of the lever and the share can be raised or depressed; or, the share may be held by two claps at the end of the lever, whilst the lever may be made to move upon a fulcrum pin in place of the before-described ridge; a "pad or fore shoe to be appended to the under side of the nose of "the lever," and a "share, of a peculiar form, suited to this "modification," are shown.

"Secondly, in the peculiar forms of the shares and "before-described "modes of attaching them to such adjustable levers."

"Thirdly, in a mode of securing the fore part of the breast to the lever in one instance, or to the chap of the lever in the other instance, by means of a pin or bolt, the "hinder part of "the breast being attached to the frame by means of a contrivance commonly called a way pin," whereby the front part of the breast is caused to rise and fall with the elevation and depression of the share; and, "should it be thought desirable "to make this adjustment whilst the plough is progressing, "that may be done by means of a longitudinal screw shaft "extending from the front to the back of the plough, the "forward end being passed through a swivelled eye or socket "at the top of the lever, the reverse end of the shaft being "supported in a bearing fixed into the back part of the plough, "and the shaft turned when required by a wheel or other "apparatus within convenient reach of the ploughman."

And, fourthly, in a mode of so attaching the back part of the *breasts* of a double-breasted plough, when such double-breasts

are cast in one piece, to a way bar firmly affixed to the frame, by means of screw pins, that nuts on these pins serve to expand or contract the width of the hinder parts of the breasts, the elasticity of the metal allowing of this contraction or expansion."

[Presented, 1862. Drawing. See London Journal (Newton's), vol. 21, (continued series), p. 12. Mechanics' Magazine, vol. 36, p. 46.]

A.D. 1841, June 19.—No. 8993.

SHAW, JAMES HENRY.—"Improvements in sowing wheat and other seed." This invention relates to "a new arrangement or combination of mechanical apparatus whereby regulated quantities of wheat or other seed may be set at intervals apart." On the boss or nave of one of the wheels which carry the machinery is affixed a cog wheel, by means of which rotatory motion is communicated to the axis of the cylinder. This cylinder is divided into as many compartments as it is intended the machine shall set rows of seed, and around each compartment are applied the apparatus for depositing the seed at the desired distance apart; and by the same apparatus the quantity of seed deposited at one time is regulated. Each seed-depositing apparatus consists of a rectangular tube, having at its lower end a valve, which is constantly pressed on and kept closed by a spring, excepting when a roller on the arm of the valve is operated on by the lower end of one of a series of curved bars, which are affixed to the front rail of the framing of the machinery. A spring plate is affixed within each rectangular tube, and a screw, by which the spring plate may be caused to leave more or less opening for the passage of seed during the time the valve is open, and thus regulate the quantity of seed deposited at one time. The cog-wheel on the axis of the cylinder is fastened thereto, in such manner as to cause the axis to turn when the wheel is turned, by means of a clutch box, on the face of which are projecting pins, which enter holes formed in the cog-wheel, and it can be caused to turn loosely, when it is desired that the sowing should be stopped, by means of a lever, by which the clutch box can be slid to or from the wheel. The ploughs, which are carried by stems fixed in the front rail of the framing can be made to go more or less deep into the soil, by means of two small wheels, which revolve on the ground and are capable of adjust-

ment. The patentee says, "What I claim is, the mode of  
" combining mechanical apparatus into a machine, by apply-  
" ing depositing apparatus," "and suitable parts connected  
" therewith, to a revolving cylinder."

[Printed &c Drawings. See London Journal (Newton's), vol. 23 (con-  
joined series), p. 442, Mechanics' Magazine, vol. 36, p. 92.]

A. D. 1841, September 8.—No. 9073.

GRANT, JOSEPH COOKE.—"Improvements in horse rakes and  
" hoes." The improvements in horse rakes consist first in  
connecting the arms of horse rakes with their axis by cast-iron  
sockets, which may be cylindrical, "square, or of any other  
" figure, so long as there is no opening at either of the sides  
" of as large a diameter as the diameter of the wood which  
" enters such socket." This mode of constructing sockets to  
the arms of horse rakes will allow the arms to work more freely  
on their axis in all states of weather, "and be more lasting  
" than when the arms are made of wood, having each a hole  
" through for the passage of their axis." To the independent  
arms of the horse rake are affixed tines or teeth, each tine being  
made of a "continued curve," to facilitate the delivery of the  
hay, straw, &c., when the arms and tines are lifted. The arms  
are each connected with a bar by a chain or other convenient  
means, and in connection with the bar is applied the combined  
action of two levers working on different axes to facilitate the  
lifting of the tines; one of the levers being so arranged as to  
require to be depressed in order to lift the tines or teeth of the  
horse rake. The improvement in horse hoes consists in apply-  
ing the compound levers action to the bar of a horse hoe having  
independent arms; the levers, as in the case of the horse rake,  
requiring to be depressed in order to lift the hoes.

[Printed &c Drawings. See Repository of Arts, vol. 18 (new series),  
p. 121, London Journal (Newton's), vol. 31, (conjoined series) p. 182,  
Mechanics' Magazine, vol. 36, p. 239.]

A. D. 1841, September 8.—No. 9082.

CROSSKILL, WILLIAM.—The invention relates, first, to im-  
provements in machinery used in crushing and rolling land,  
and consists in placing on an axis a series of rolling surfaces,  
to the outer circumference of each of which are attached teeth,  
crane teeth being also placed at right angles to the face of each

rolling surface. In the construction of this machine, the cross teeth are so placed that a radial line drawn from the centre of the axis to the circumference of the rolling surfaces will not pass through the centre of any one of the teeth; and this, added to the circumstance that the rolling surfaces are free to turn on their axes and independent of each other, will render this machine "most useful for crushing clods and breaking up strong land, and also for rolling wheat as soon as sown, and also for rolling wheat upon light land in the spring after frost."

Secondly, the invention consists in the "mode of arranging a series of cutters in a suitable carriage for producing narrow trenches or cuts through the turf of grass land, whereby such cutters can be lifted and cleaned from time to time, and combining therewith suitable drills for sowing seed and manure in such cuts or trenches." To a shaft or axis, moving in bearings on the frame, are applied arms, which move bars sliding in grooves at the ends of connecting links; such bars being affixed to a series of blades or cutters, which pass through slits or openings in a plate. By this arrangement, whenever the cutters become clogged, they can, by means of levers affixed on the axis—one on each side of the machine—be raised up through the slits or openings in the plate, and thereby cleared; the depth to which the cutters shall work being also adjusted by means of these levers, each of which can be fixed in any desired position, by means of a stop, inserted above the lever in one of a number of holes formed in a curved bar, which is affixed to the side framing of the machine. The drills for sowing seed and manure, which are combined with the above-described machinery, are similar to the parts of ordinary drills.

[*Patent.*] Drawings. See Repertory of Arts, vol. 17, (*new series*) p. 296; *London Journal* (*Newton's*), vol. 31 (*continued series*), p. 427, vol. 33 (*continued series*), p. 208, and vol. 38 (*continued series*) p. 140, *Mechanics Magazine*, vol. 36, p. 284 and vol. 40, p. 293, *Patent Journal*, vol. 1, p. 237, *Law Times*, vol. 5, p. 342, vol. 10, p. 459, and vol. 11, p. 361.]

A.D. 1841, September 20.—No. 9092.

HUCKVALE, THOMAS.—The invention relates, firstly, to "the mode of constructing horse hoes for thinning turnips" by hoeing them with rotatory cutters." Motion is com-

communicated, through toothed gear, from the axis of the running wheels, to a shaft or axis, which turns in bearings affixed to the framing of the machine. On this axis or shaft is affixed a rotatory frame, which carries four arms, each having a cutter or hoe formed thereon. Hence, as the frame revolves, the cutters will pass across the ridge and remove a portion thereof, together with the turnips growing thereon. The space between each cut of the cutters or hoes may be increased or diminished by varying the relative speeds of the axes above described, and by removing two of the cutters.

Secondly, to "the mode of constructing horse hoes for thinning turnips, by applying oscillating hoes." The shaft or axis, which, as in the last case, derives its motion from the axis of the running wheels, has two cranks formed thereon, to which two connecting rods are attached, the other ends of the connecting rods being attached by pin joints to swinging frames, which move on axes, and carry the cutters or hoes, on their lower bars. "The positions of the axis of the swinging frames" "can be varied by placing them in the different holes formed in the framing for that purpose, and the positions of the pin joints of the connecting rods can also be varied." "It will readily be seen that, as the wheels revolve, an oscillating motion will be communicated to the cutters or hoes."

Thirdly, to "the mode of constructing horse hoes with horizontal rotatory cutters." In this machine, the shaft or axis, which, as in the before-described machines, derives motion from the running wheels, gives motion to a vertical axis turning in suitable bearings, by means of bevelled wheels. On this axis is affixed the frame and arms, which carry the cutters or hoes; such rotatory cutters acting horizontally, "by which the horse may walk between two rows or ridges, and the cutters or hoes cut away portions at intervals of two ridges, together with the turnips growing thereon." Hoes for hoeing the top and sides of the ridges may be applied to either of the three horse-hoes above described; such hoes being capable of being set nearer to or further from each other by means of sockets, which, sliding on that part of the framing to which they are applied may be fixed by set screws; the application of these hoes, however, is not necessary to the invention.

Fourthly, to the application of machinery, suitably arranged to move on wheels, "to carry liquids, and to cause such liquids to be delivered in small jets against the growing plants of turnips planted in rows" for the purpose of destroying turnip flies and other insects. On an axis, moving in bearings carried by the framing, and which derives motion, through pulleys and an endless strap or chain, from the axis of the running wheels, is affixed a wheel, "having recesses formed into its periphery, which, becoming full of liquid used, project it with force against the plants on the ridges;" such wheel revolving partly in a trough, into which the liquid flows through a pipe from a cask or other vessel, the flow of liquid being regulated by a stop-cock. Some part of the wheel is enclosed by a shield, which prevents the liquid flying off till the recesses have passed beyond it. In place of using the revolving wheel, a rose-head may be affixed to a pipe fixed into the trough, "in such manner as to project the liquid in small jets against the plants on the ridges;" or, this pipe might be fixed into the cask or vessel containing the liquid and thus dispense with the trough and the wheel."

[Printed, 2s. 6d. Drawings.]

A. D. 1841, September 29. — No. 9106.

WHILE, JOHN. — An "improved horse hoe," which "consists in a peculiar and novel arrangement of apparatus containing vibratory cutters moving laterally, whereby one or more rows of turnips or other plants may whilst growing be hoed or cut crossways of the drilled line, and the land hoed lengthways at the same time." The blades of the hoes, which cut lengthways of the furrows, are affixed to sockets in the outer longitudinal bars of the framework. The stems of the transverse or vibratory cutting hoes are suspended by joints from pendant bracket arms, which are held in sockets at the hinder parts of two longitudinal bars. These hoes are made to oscillate laterally on their joints by means of two longitudinal shafts, which extend along the under part of the frame on the same level as that of the axle of the running wheels, and the extremities of which are mounted and turn in sockets in the fore and hinder part of the machine. In the hinder part of the shafts are formed cranks, to which are appended *forked connecting rods*, between the forks of which



the stems of the vibratory hoes are inserted; to the fore part of the shafts are affixed bevil pinions, which take into the teeth of the bevil wheels on the shaft of the running wheels; so that, as the running wheels with their axle revolve, the bevil wheels will cause the pinions to give rotatory motion to the shafts, and thereby cause the hoes to oscillate laterally upon their joints. The action of the vibratory hoes may be suspended by drawing the pinions on the shaft out of gear with the bevil wheels; this is done by depressing thumb levers, to which are attached rods and chains, or cords, passed under and over guide pulleys, and connected at their reverse ends to the bottom parts of swinging levers, which are connected with the bevil pinions; the pinions are pressed into gear again by means of springs. By removing the vibratory hoes and their pendant arms, and replacing them by fixed spear-pointed cutters, the apparatus may be made to act as a scarifier. The inventor claims "the adaptation of vibratory cutters to a machine for hoeing turnips and other crops by reciprocating lateral movements, and the connecting mechanism by which the said vibratory cutters are made to act through gear communicating with the running wheels of the machine, and also the means by which their actions may be occasionally suspended."

[Printed, 10d. Drawing. See London Journal (Newton's), vol. 20 (continued series), p. 408.]

A.D. 1842, May 9.—No. 9341.

WARREN, JOSEPH.—"Certain improvements in ploughs," which consist, firstly, in raising and lowering the beam by means of shifting bolts and a regulating screw. The end of the beam fits into a recess in the end of the top part of the frame, and two bolts which are passed through the head of the front shaft, through the top part of the frame, and through slots in the end of the beam, are screwed on the outside by nuts. By turning the regulating screw, which passes through the beam, and is turned up at its lower end towards the fore shaft, to which it is firmly bolted, the beam and connecting bolts can be kept in any position of which the range of the slots will admit.

Secondly, in regulating the depth of the share and mould board by the combination of a wedge, screw, and crank, or

by the combination of the wedge with any other means of equivalent effect to the said screw and crank. The wedge is passed under the ploughshare from behind, and the point of a screw, which is supported in bearings projecting from the fore part or sheaf of the frame, is fixed in the butt end of the wedge so that, as it is turned inwards or outwards, the wedge is made to advance or recede, and the ploughshare is depressed or raised; the mould board being, at the same time, raised or depressed in a like degree, by means of a bell crank, secured at the knuckle to the front part of the frame, and by the end of one wing to the mould board, while the end of the other wing rests on the shoulder of the screws.

Thirdly, in a mode of depressing the share by raising the frame of the plough at the back. An upright rod connects the sole at the after part with the top and bottom parts of the frame, and is screwed at that part where it passes through the bottom part of the frame, so that, by turning it round, the back part of the frame is detached from and raised above the sole, and the ploughshare in front is proportionally depressed.

Fourthly, in "regulating the height and inclination of the beams and depth of the shares and mould boards of ploughs," "by securing the beam to the top part of the frame and connecting the top part of the frame to the handle by means, in both cases, of shifting bolts and a regulating screw."

Fifthly, in giving the ploughshare, when intended to be used in the tilling of strong land, an elongated and pointed form.

Sixthly, in making mould boards to double-breasted ploughs "so curved," "that they present an outline continually receding or diverging outwards from the base to the upper extremity."

Seventhly, in a wheel plough for making drains, which consists of a beam, a frame, "two couples which are fixed at top to the beam and at bottom to the sole," a ploughshare, which fits into a socket in the end of the sole, a breast, and mould board; "two racks and pinions, one attached to the frame and the other to the beam, by acting simultaneously on which by means of the hand rods," "the sole and ploughshare may be depressed to any extent desired, or by

"acting on one only of them the sole and ploughshare may be raised more at one end than the other."

The patentee says, "I declare that I claim none of the parts of which the ploughs or parts of ploughs," consist, "as in and by itself new, and that I claim them only in so far as they are newly combined for one or other of the useful purposes aforesaid."

[Printed, 1s. Drawings. See London Journal (Newton's), vol. 22 (continued series), p. 445. Mechanics' Magazine, vol. 37, p. 477. Record of Patent Inventions, vol. 1, p. 279.]

A.D. 1842, June 7.—No. 9340.

IRVING, WILLIAM.—"An improved corn drill," wherein the principal features of novelty consist in "the application and use of perforated plates or discs for dropping or sowing all kinds of seed or grain, and their combination with wheels and pinions or other mechanical contrivances, for the purpose of carrying out the principle and its application," and also in a peculiar arrangement of the coulters. The seed-discs are perforated with holes, and are received in and accurately fitted to recesses in plates of metal or other material fixed upon the interior of the bottom of the seed box. As these discs are caused to revolve, owing to their connection by intermediate gear with the running wheels, the seed falls through the holes in the discs, and passes round until it arrives over holes in the bottom of the seed box, through which it drops into spouts, and thence into the furrows. The coulters hang freely upon an axle or rod, and they can be raised out of the ground or pressed to any desired depth in the soil, by giving a revolving motion to a roller or drum, moving freely upon its axis, and having chains, the other ends of which are fastened one to each of the coulters, attached thereto; a second set of chains being also attached to this drum, the other ends whereof are fixed to levers, jointed to a board, which, together with the levers and chains, are used as a press upon the coulters. "The principle of this machine admits of many other modifications, by which it may be applied to sowing the various kinds of seeds required."

[Printed, 1s. Drawings. See London Journal (Newton's), vol. 24 (continued series), p. 176. Mechanics' Magazine, vol. 37, p. 545. Record of Patent Inventions, vol. 1, p. 378.]

A. D. 1842, June 13.—No. 9389.

GARRETT, RICHARD. "Improvements in the construction of horse hoes, scarifiers, drag rakes, and drills for cultivating land." As respects the horse-hoe, the improvements consist, firstly, in "a mode of suspending the guide bar which supports the levers (a series of independent arms carrying the respective hoes) by means of chains passed over eccentric pulleys, whereby the hoes may be raised and lowered when required." Secondly, in "a contrivance for communicating to the hoes lateral movements," the conductor being able, by means of handles, to turn a longitudinal shaft, from which extends downwards an arm with chains attached to its end, the outer extremities of these chains being made fast to the end of the front horizontal bar, to which the levers are jointed. Thirdly, in forming the axes of the running wheels "by studs or pins extending from angular pieces or brackets," attached to the hinder rail of the framework; which arrangement admits of the distance between the wheels being widened or contracted, to suit the ridges of the land. Fourthly, in "the manner of giving different inclinations to the cutting edges of the hoes," by raising or lowering bracket arms, which are affixed to the front of the carriage for the purpose of holding the before-mentioned front horizontal bar, whereby the front or jointed ends of the levers will be raised or depressed, and, consequently, the stems of the hoes will be caused to incline, more or less, from their erect positions. And, fifthly, in forming the cutting parts of the hoes in distinct pieces from the stems, so that the hoes may be changed when worn; these cutting parts being made of iron, and converted into steel after they have been so formed.

As respects the scarifier, the improvements consist in mounting the square shaft or axis of a series of indented wheels, or a roller, in a frame supported upon running wheels which running wheels can be raised or lowered, so as to regulate the depth to which the wheels or roller shall penetrate the ground.

As respects the drag-rake the improvements consist in placing the fulcrum or joints of a series of levers and tires upon a horizontal rod, supported by bracket pieces and upright

stems; so that, by sliding up the brackets and stems in their sockets, the more or less erect position of the tines may be adjusted.

As respects the drill, the improvements relate, first, to a mode of steering, and consist in attaching the shafts to the frame by a joint pin, and causing the carriage, with the drills, to turn horizontally upon that pin by means of a toothed gear. Secondly, the improvements consist in introducing into an ordinary manure drill box "an extra stirrer or agitator, which, "being worked by an eccentric, keeps the material continually "in motion," and prevents the manure from adhering together. Thirdly, in a mode of drilling two kinds of grass seed, by placing them in separate compartments, and, by the simultaneous rotation of a brush roller in one compartment and a cup-wheel in the other, causing them to be conducted together down one spout. Fourthly, in attaching the coulter and spouts to horizontal rods; these rods being made to swing upon vibrating levers, which are worked by a crank rod and handles for the purpose of guiding the coulters and spouts. And, fifthly, in mounting concave rollers, for forming and equalising the shape and height of the ridges, so as to slide loosely upon "a horizontal shaft, acting as a fore carriage, and supporting "part of the weight of the drill."

[Patent, 1s 4d. Drawing. See London Journal (Newton's), vol. 22 (continued series), p. 446; Record of Patent Inventions, vol. 1, p. 397.]

A. D. 1843, July 6.—No. 9402.

**HALL, JOSEPH.**—"Machinery for tilling land."

1. A delving and crushing machine is described. The framework of the machine travels on three wheels, and carries two "parallel motion and tilting frames;" two axes extend horizontally across the machine, and revolve in bearings in these frames, and upon the axes are fixed two sets of wheels (viz., three on the foremost axle and two on the hindmost axle), in such manner that the wheels of one set work in the spaces between those of the other set. Each wheel is armed with a number of "delvers and crushers," secured in angular positions across its periphery by swing joints, which allow a little play outwise as well as forwards and backwards, but do not permit *them to turn over*. By means of the parallel motion and tilting frames, the parallelism of each set of delvers and crushers to

the plane of motion, as well as of the two sets of delvers and crushers to each other, is preserved. As the machine is drawn onward, the delvers and crushers penetrate and break up the soil. Machines may be constructed on this plan with more than two sets of delving and crushing wheels, or with only one set.

2. A harrowing machine on a similar construction to the above is described. Instead of "delving and crushing wheels," tines, adjustable to any required inclination, are fitted to the axle.

3. A rolling machine is made by substituting a plain roller for the axle carrying tines, &c.

4. A "double ploughing machine" is formed by fitting two ploughs on the axle "in such relative positions the one behind the other, as that in working they shall make two furrows at a time close to each other."

5. A "circular harrow and dibbling machine" is described, in which "the harrowing tines are affixed to two, three, or more iron circles," "connected by cross pieces, and the dibbling spikes are affixed horizontally at regular distances to the exterior of the outside circle." After ground has been harrowed by this machine it is only necessary to turn it on its edge to make it serve also as a dibber. The axle of the machine has an eye on one end, through which the handle is passed, so that it may be worked either horizontally or vertically.

6. "Parallel expanding spade." This is formed of three prongs, the centre one fixed to the end of the handle, and the two side prongs connected to the centre prong and to a sliding socket on the handle by parallel rule joints. By moving the socket up or down, the prongs are brought close together or separated. A catch on the socket holds them in the position required.

7. "Expanding rake." This has a jointed head, pivotted to the handle, and an arrangement like that of the spade above described by which the portions of the head can be set at any required angle.

8. "Land emb or weed extractor," for hand use. An iron spud is affixed to the end of a handle. Just above the spud is a "forked gripper" on a swivel joint. When the weed has been dug out by the spud, the "gripper" is moved so as to grasp and hold the weed, by means of a rod along the handle.

*(Printed, 1861. Drawing. See Record of Patent Inventions, vol. 1, p. 410.)*



A.D. 1842, July 7.—No. 9405.

VASAVOUR, Lady ANN.—“Improvements in machinery for tilling land.”

[No Specification enrolled.]

A.D. 1842, September 22.—No. 9474.

SANDERS, JOHN, WILLIAMS, WILLIAM, TAYLOR, SAMUEL LAWRENCE, ARMSTRONG, WILLIAM, and DAVID, EVAN WILLIAM. The invention relates, first, to improvements in the construction of ploughs, and consists in connecting a lever, which moves on an axis and carries the share, by means of a connecting rod or link, to another lever, which proceeds backwards within reach of the ploughman, and the back end whereof can be fixed in a rack; by this arrangement the position of the share can be regulated. Another improvement consists in applying a “draught bar” “intermediate of the distance” between the coulter and the end of the beam; a draught chain or rod is attached at the lower end of the bar, and works through a guide plate, which is affixed to a plate moving on an axis at the fore end of the beam.

Secondly, to “modes of constructing plough shares, so as to obtain a greater mass or more extended surfaces of chilled cast iron at the lower edge of the land side of a cast plough share.” Shares of different shapes are described; in one a groove is formed near the lower edge of the land side; in another the lower edge is made prominent, the lower part of the groove being omitted; in another “the lower edge of the land side of the share is bevelled;” in another the groove is “on the under surface of the share near to the lower edge of the land side of the share,” the object being “to cause the lower edge of the land side of each share to be chilled in casting to be more lasting at that edge.”

Thirdly, to improvements in the construction of harrows, one of which improvements consists in a mode of making harrows with irregular sides, each harrow being composed of straight bars, crossing in diagonal directions, which bars “are either affixed together where they cross or the upper ends of the teeth or tines pass through the bars, so as to allow of expanding and contracting the distance at which the tines work, in which latter case the bars or rails at the two ends

"are made in several parts sliding on each other, and affixed  
"by pins passing through them," "the inner bars having  
"sockets at their ends to slide on the end bars. These  
"harrows may be also made to expand or contract, by causing  
"the diagonal bars to slide upon the front, and back bars or  
"rails, or the bars where they cross may be made fast, and  
"where such harrows are not required to expand or contract,  
"the bars which combine the diagonal bars together may run  
"across at right angles to the line of the movement of the  
"harrows." Another improvement relates to wheel harrows,  
and consists in "placing the teeth or tines on axes, whereby  
"the depth or position at which they work may be varied  
"from time to time, and when with proper teeth these harrows  
"may be used for working of the land before, and also in  
"substitution for ploughing."

Fourthly, "to a mode of constructing horse rakes, and consists in causing the axis of the tines or teeth to be depressed,  
"carrying with it one end of each tine or tooth, the tines or  
"teeth being supported by a bar intermediate of their length  
"causing the working points of the tines or teeth to rise off  
"the ground, and thus deliver the hay or other matters raked  
"up."

And, fifthly, "to improvements in machinery for cutting  
"chaff, and also to improvements in machinery for cutting  
"turnips and other roots."

[Printed, 2s 6d Drawings.]

A.D. 1843, June 15.—No. 9789.

BENTALL, EDWARD HAMMOND. — The invention relates to improvements in ploughs, and consists, first, in forming the nose part of the breast of a distinct piece from the upper part of the breast, an adjustable lever with the share affixed thereto, for the purpose of having its point raised or depressed, being attached to the frame of the plough, upon the same principle as described in No. 8982, June 10, 1841, the nose part of the breast being, however, in this instance firmly attached to the lever by a nut and bolt. The object of this improvement is to prevent the nose of the breast being broken off by the pressure or resistance of the earth between it and the point of the lever, as occasionally happened in ploughs constructed according to the former Specification. The adjustable

lever may be appended to the frame of the plough by a horizontal bolt, instead of the vertical bolt shewn in the former Specification.

Secondly, in having "blocks" cast upon the upper surface of the ground plate, "with a vertical pin in each, which pins, "when passed through corresponding eyes in the lower part "of the frame, and made fast by nuts, connect the sole and "frame firmly together."

Thirdly, in an improved mode of bracing the handles of ploughs, by forming a truss of wrought-iron bars, "which "are united in the middle "by a strong rivet, and are "attached at their ends to the arms of the plough by similar "fastenings."

Fourthly, in improved modes of constructing the cats-head of a plough, as exhibited under two modifications. In the first plan two segmental plates are affixed in horizontal positions to the forked end of a plough beam, these plates being perforated with two series of holes, for the purpose of fixing, by means of a vertical pin, the position of the hake, which hake turns upon a pivot. "The ends of the segment plates are held and firmly "braced in their positions by a lateral rod," "bolted to the "beam and frame, which lateral rod also affords considerable "stability to the beam when the draft is in an oblique direction." In the second plan, a "horizontal segmental groove "or slot" is formed in an arm at the end of the plough beam, in which slot a vertical pin, having at its lower end an eye, through which the draft rod passes, is inserted; "this pin is "readily adjusted, and fixed in any part of the segmental arm, "for the purpose of giving any required angle to the draft," by means of nuts.

Fifthly, in improved modes of effecting the adjustment of the wheels of ploughs. The running wheels turn upon studs extending from the lower ends of vertical rods, which pass through sockets attached to the yoke, which yoke swings freely upon a pin inserted in a peculiarly formed bracket affixed to the beam. "Long slots in the yoke admit of the sockets being "slid laterally for adjustment."

Sixthly, "in the attachment of peculiarly constructed adjustable sockets, boxes, or clips to the beam of a plough, in "which the coulter is to be held, and by the adjustment of "which the position of the coulter may be changed."

An improved apparatus is described "for ascertaining the draft or amount of resistance opposed to any plough or other instrument employed in tilling land." The head of the plough or other implement is attached to a draft staple, and the horses to the eye of a horizontal rod at the reverse end, which horizontal rod slides in sockets or apertures formed in the ends of the iron frame or carriage of the apparatus, and has a spring to keep it back in a quiescent position when not acted upon. A double-armed lever, the axle of which is carried by an arch or standard affixed to the frame, is connected with the horizontal rod by a link and a stem, in such a manner that when the rod is drawn out the lever is made to move upon its axle, and to depress a vertical rod attached to its upper extremity. The upper end of this vertical rod is bent over and connected to the rod of a piston working in one or two vertical tubes which contain mercury, and have a communication from one to the other through a contorted channel. Hence, as the lever is moved upon its axle the rod and piston will be made to rise and fall by its vibrations, and cause the mercury to indicate, by a graduated scale on an outside casing, the average draft or force applied to the end of the horizontal rod.

(Printed, 1s. 2d. Drawings. See London Journal (Newton's), vol. 24 (containing service), p. 140.)

A.D. 1843, June 21.—No. 9794.

READ, JOHN.—This invention relates, firstly, to improvements in ploughs for draining and subsoiling land, "by combining two pairs of wheels with a subsoil plough, all the wheels running on the same plane." "This plough is principally intended to follow in the furrow of another plough, and the wheels come near together at the lower parts in order that they may run in a furrow made by a previous plough." Secondly, the inventor claims "the application of a pair of wheels, both running on the land, to support the fore part of a turn-rest plough"; "also the application of a pair of wheels of equal diameter, or one wheel to support the hinder part of such description of ploughs, such wheels running in the furrow as it is formed; and, further, the application of a mole share or subsoil share to turn-rest ploughs." Each pair of wheels turns on necks or axes carried by a bar, which passes through the beam, where it is secured by a screw or

other convenient means. The depth of the furrow is regulated by the bars which carry the axes or necks of the fore and hind wheels "being allowed to come through the beam, more or less, and then being fixed by their respective screws."

[Printed, 10d. Drawings. See Repertory of Arts, vol. 3 (*enlarged series*) p. 138.]

A. D. 1843, July 3.—No. 9812.

PHILLIPS, CHARLES.—Machines for reaping, chaff-cutting, &c

The portions referring to reaping machines are partly improvements on No. 8962, A. D. 1841.

1. A machine is described in which the cutters consist of a pair of serrated plates, one above the other. The teeth are sharpened on the sides, and when a to-and-fro motion is given to one plate, a shearing action is produced between the two sets of teeth. A set of the cutters is mounted on front of a frame on wheels with handles behind by which it is to be pushed forward. Motion is given to the upper plates by a bell-crank lever worked by an eccentric driven from one of the supporting wheels, which may have spikes on its periphery to improve its hold on the ground. Above the cutter plates are several rakes pivotted on arms set radially on a revolving shaft; similar arms on an eccentric are fixed to the rakes so that they are always kept in a vertical position. They serve to clear the cutters. The same object may be attained by a small roller immediately over the cutters. The machine is principally intended for cutting grass and clover, but cutters of the above sort may be applied to the machine described in No. 8962, A. D. 1841, and used for cutting corn.

2. The circular cutters or "revolving shears" described in No. 8962, A. D. 1841, may have a reciprocating instead of a continuous rotatory motion. Motion is given from the main shaft to a crank shaft, whence a horizontal vibrating motion is imparted to a lever. Connecting rods pivotted at points along this lever are pivotted at their other ends to short arms on the spindles of the cutters, which have thus the required motion given to them. Half the cutters are thus actuated, the other half are driven from them by short slotted arms on their spindles engaging with pins on the first named set.

[Printed, 1s. 6d. Drawings.]

A.D. 1848, July 3.—No. 9813.

WEDLARE, THOMAS.—“Machinery for making hay.”

[No Specification enrolled.]

A.D. 1843, July 6.—No. 9820.

GRANT, JOSEPH COOKE.—This invention “relates to the so  
“constructing apparatus in combination with harrows, that  
“the tines of the harrows may be cleansed or scraped from  
“time to time, as occasion may require.” Each harrow rests  
on what the inventor calls “a scraping or cleansing frame, so  
“arranged in respect of the tines or teeth, that on the teeth or  
“tines being raised, they move through holes on the bars”  
of the scraping frames, the holes or openings “for the teeth or  
“tines allowing of the tines passing freely through, but pre-  
“venting any matters which may be on or amongst the teeth  
“or tines going up with the tines through the holes or open-  
“ings, by which means all the tines of a harrow will be  
“simultaneously cleansed.” The harrows, with their scraping  
frames, are suspended by chains in a quadrangular frame,  
carried by three wheels, two of which are on axes fixed to the  
frame, whilst the third turns in a bearing in front of the imple-  
ment, and is capable of “locking,” or moving round with its  
axis or spindle. The raising of the harrows may be accom-  
plished in various ways, but the inventor believes “that the  
“arrangement of apparatus shown in the drawings will be  
“found most convenient for this purpose.” To axes, turning  
in bearings on either side of the scraping frames, are affixed  
arms; these arms are combined together by bars, and extend  
backwards, having swinging frames, with handles affixed, sus-  
pended from their upper ends. To the same axes are affixed  
other arms, connected by pin joints, “the holes of which are  
“long enough to allow of play in passing the centers,” to a  
third set of arms; the latter are affixed to axes turning in suit-  
able bearings on either side of the quadrangular frame; and  
the slotted ends of both sets of arms embrace rollers which are  
carried by the bars of the harrows. By this arrangement it  
follows that, when the first set of arms are depressed, the  
harrows will be raised. This invention is not confined to  
harrows carried by wheels, but includes all harrows having  
“cleansing apparatus or scrapers combined therewith in such



other convenient means. The depth of the furrow is regulated by the bars which carry the axes or necks of the fore and hind wheels "being allowed to come through the beam, more or less, and then being fixed by their respective screws."

[Printed, 10d. Drawings. See Repertory of Arts, vol. 3 (*enlarged series*) p. 138.]

A. D. 1843, July 3.—No. 9812.

PHILLIPS, CHARLES.—Machines for reaping, chaff-cutting, &c.

The portions referring to reaping machines are partly improvements on No. 8962, A. D. 1841.

1. A machine is described in which the cutters consist of a pair of serrated plates, one above the other. The teeth are sharpened on the sides, and when a to-and-fro motion is given to one plate, a shearing action is produced between the two sets of teeth. A set of the cutters is mounted on front of a frame on wheels with handles behind by which it is to be pushed forward. Motion is given to the upper plates by a bell-crank lever worked by an eccentric driven from one of the supporting wheels, which may have spikes on its periphery to improve its hold on the ground. Above the cutter plates are several rakes pivotted on arms set radially on a revolving shaft; similar arms on an eccentric are fixed to the rakes so that they are always kept in a vertical position. They serve to clear the cutters. The same object may be attained by a small roller immediately over the cutters. The machine is principally intended for cutting grass and clover, but cutters of the above sort may be applied to the machine described in No. 8962, A. D. 1841, and used for cutting corn.

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[Printed, 1s. 6d. Drawings.]

A.D. 1843, July 3.—No. 9813.

WEDLAKE, THOMAS. —“ Machinery for making hay.”

No Specification or rolled ]

A.D. 1843, July 3.—No. 9820.

GRANT, JOSEPH COOKE.—This invention “relates to the so  
“ constructing apparatus in combination with harrows, that  
“ the tines of the harrows may be cleansed or scraped from  
“ time to time, as occasion may require.” Each harrow rests  
on what the inventor calls “a scraping or cleansing frame, so  
“ arranged in respect of the tines or teeth, that on the teeth or  
“ tines being raised, they move through holes on the bars”  
of the scraping frames, the holes or openings “for the teeth or  
“ tines allowing of the tines passing freely through, but pre-  
“ venting any matters which may be on or amongst the teeth  
“ or tines going up with the tines through the holes or open-  
“ ings, by which means all the tines of a harrow will be  
“ simultaneously cleansed.” The harrows, with their scraping  
frames, are suspended by chains in a quadrangular frame,  
carried by three wheels, two of which are on axes fixed to the  
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“ arrangement of apparatus shown in the drawings will be  
“ found most convenient for this purpose.” To axes, turning  
in bearings on either side of the scraping frames, are affixed  
arms; these arms are combined together by bars, and extend  
backwards, having swinging frames, with handles affixed, sus-  
pended from their upper ends. To the same axes are affixed  
other arms, connected by pin joints, “the holes of which are  
“ long enough to allow of play in passing the centers,” to a  
third set of arms; the latter are affixed to axes turning in suit-  
able bearings on either side of the quadrangular frame; and  
the slotted ends of both sets of arms embrace rollers which are  
carried by the bars of the harrows. By this arrangement it  
follows that, when the first set of arms are depressed, the  
harrows will be raised. This invention is not confined to  
harrows carried by wheels, but includes all harrows having  
“ cleansing apparatus or scrapers combined therewith in such

other convenient means. The depth of the furrow is regulated by the bars which carry the axes or necks of the fore and hind wheels "being allowed to come through the beam, more or less, and then being fixed by their respective screws."

[Printed, 10d. Drawings See Repertory of Arts, vol. 3 (enlarged series) p. 138.]

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1. A machine is described in which the cutters consist of a pair of serrated plates, one above the other. The teeth are sharpened on the sides, and when a to-and-fro motion is given to one plate, a shearing action is produced between the two sets of teeth. A set of the cutters is mounted on front of a frame on wheels with handles behind by which it is to be pushed forward. Motion is given to the upper plates by a bell-crank lever worked by an eccentric driven from one of the supporting wheels, which may have spikes on its periphery to improve its hold on the ground. Above the cutter plates are several rakes pivoted on arms radiating on a revolving shaft; similar arms on an eccentric are fixed to the rakes so that they are always kept in a vertical position. They serve to clear the cutters. The same object may be attained by a small roller immediately over the cutters. The machine is principally intended for cutting grass and clover, but cutters of the above sort may be applied to the machine described in No. 8962, A.D. 1841, and used for cutting corn.

2. The circular cutters or "revolving shears" described in No. 8962, A.D. 1841, may have a reciprocating instead of a continuous rotatory motion. Motion is given from the main shaft to a crank shaft, whence a horizontal vibrating motion is imparted to a lever. Connecting rods pivoted at points along this lever are pivoted at their other ends to short arms on the spindles of the cutters, which have thus the required motion given to them. Half the cutters are thus actuated, the other half are driven from them by short slotted arms on their spindles engaging with pins on the first named set.

[Printed, 10d. Drawings.]

A.D. 1843, July 3.—No. 9813.

WEDLAKE, THOMAS.—"Machinery for making hay."

[No specification entered.]

A.D. 1843, July 6.—No. 9820.

GRANT, JOSEPH COOK. —This invention "relates to the so  
" constructing apparatus in combination with harrows, that  
" the tines of the harrows may be cleansed or scraped from  
" time to time, as occasion may require." Each harrow rests  
on what the inventor calls "a scraping or cleansing frame, so  
" arranged in respect of the tines or teeth, that on the teeth or  
" tines being raised, they move through holes on the bars"  
of the scraping frames, the holes or openings "for the teeth or  
" tines allowing of the tines passing freely through, but pre-  
" venting any matters which may be on or amongst the teeth  
" or tines going up with the tines through the holes or open-  
" ings, by which means all the tines of a harrow will be  
" simultaneously cleansed." The harrows, with their scraping  
frames, are suspended by chains in a quadrangular frame,  
carried by three wheels, two of which are on axes fixed to the  
frame, whilst the third turns in a bearing in front of the imple-  
ment, and is capable of "locking," or moving round with its  
axis or spindle. The raising of the harrows may be accom-  
plished in various ways, but the inventor believes "that the  
" arrangement of apparatus shown in the drawings will be  
" found most convenient for this purpose." To axes, turning  
in bearings on either side of the scraping frames, are affixed  
arms; these arms are combined together by bars, and extend  
backwards, having swinging frames, with handles affixed, sus-  
pended from their upper ends. To the same axes are affixed  
other arms, connected by pin joints, "the holes of which are  
" long enough to allow of play in passing the centers," to a  
third set of arms; the latter are affixed to axes turning in suit-  
able bearings on either side of the quadrangular frame; and  
the slotted ends of both sets of arms embrace rollers which are  
carried by the bars of the harrows. By this arrangement it  
follows that, when the first set of arms are depressed, the  
harrows will be raised. This invention is not confined to  
harrows carried by wheels, but includes all harrows having  
" cleansing apparatus or scrapers combined therewith in such

" manner as to allow of the tines being cleansed at one time ;  
 " and although " the tines will be better scraped or cleansed  
 " by the scrapers of each encompassing it on all sides," the  
 invention is not confined thereto, " as the scrapers may be  
 " otherwise furnished."

[Printed 1847. Drawings. See *Repertory of Arts*, vol. 3 (enlarged series),  
 p. 194. *London Journal* (*Newton's*), vol. 34 (conjoined series), p. 425.]

A. D. 1843, July 13.—No. 9831.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—A "ma-  
 " chine or implement for ploughing, harrowing, or tilling land,"  
 " composed of two principal parts," " namely ; first, the fore  
 " carriage," which consists of two wheels and a framing, with the  
 " pole or shafts for three horses ; second, the hinder carriage,  
 " which also comprises two wheels, and the framing of the  
 " harrow plough," furnished with teeth or tines. The hinder  
 carriage is connected with the axletree of the fore wheels by a  
 cast iron framing in the shape of a swan's neck, so constructed in  
 order to allow the large fore wheels to pass freely underneath,  
 when it is required to make a short round. The head or end  
 of the swan's neck rests upon the middle of the fore axletree,  
 and is traversed by a vertical bar of wrought iron, bolted to the  
 axletree, and in the upper part of which a rectangular mortice  
 is made for the purpose of receiving a bolt or pin, by means of  
 which the swan's neck is held up. To the other end of the  
 swan's neck is connected a set screw, the head of which carries  
 a wheel, and which passes through a female screw made in a  
 plate or block, " which is furnished with two pivots or bolts  
 " that are free in the branches or bearings which form the end  
 " of the swan's neck, and whereby it may be raised or lowered  
 " at pleasure." " It is necessary that the screw should be  
 " held in an iron collar," which holds it securely in connection  
 with a short cross piece, the two ends whereof are supported by  
 two bearings in cast or wrought-iron curved pieces ; these are  
 bolted upon the broadest side of the back cross piece of the  
 framing, and by this arrangement, the depth to which the tines  
 will enter the ground can be regulated. The tines, which must  
 be very strong, and " arranged in such a manner that each tine  
 " may form a separate furrow without interfering with any  
 " following one, formed by any other tine," are carried by two  
 " pieces of the framing. The hinder wheels " are made of

“ cast iron and mounted upon axes, altogether independent of  
 “ each other,” being “ simply made to turn freely on short  
 “ iron pivots fixed at the lower ends of wrought or cast-iron  
 “ racks,” “ the greater portion of which is toothed.” Pinions,  
 consisting of four teeth, gear into the teeth of these racks, and  
 are firmly fixed on a wrought-iron shaft, which turns in bearings  
 in a cast-iron framing, attached to the lateral side pieces of the  
 wooden framing; these pinions have winches fastened upon  
 their axes, inside the apparatus, and, “ according to the direc-  
 “ tion in which these winches or cranks are turned, the entire  
 “ framing, carrying the tines or teeth therewith, will rise or  
 “ descend.” “ In order that the hinder framing that carries  
 “ the tines should be made to remain in any particular and  
 “ fixed altitude, it is necessary to furnish each of the axes”  
 “ with grooved or toothed discs,” “ which act in the same way  
 “ as ratchet wheels, and are made with as many notches or  
 “ openings as the little pinions carry teeth.” “ Into one of  
 “ the notches of each of the discs a sort of iron catch” “ is  
 “ made to fall. This iron catch has a handle at its upper end,”  
 “ and a spring placed behind it in the interior of the box which  
 “ retains it against the support.” The teeth or tines may be  
 exchanged for knives with cutting edges, or any other descrip-  
 tion of teeth or tines, which are applicable, may be used. The  
 patentee claims, as his invention, “ the peculiar combination or  
 “ arrangement of parts above described, or any modification  
 “ thereof as applied to the purposes above mentioned.”

(Printed, 10d. Drawing. See Repertory of Arts, vol. 2 (enlarged series),  
 p. 288. L. 407. J. 407. (Newton's), vol. 24 (enlarged series), p. 105.  
 Mechanics' Magazine, vol. 40, p. 238.)

A. D. 1843, July 15.—No. 9842.

RANSOME, ROBERT, MAY, CHARLES, BIDDLE, ARTHUR,  
 and WORBY, WILLIAM. — Improvements in agricultural  
 machinery, which consist, first, in a “ mode of forming the  
 “ beams of ploughs, whereby stiffness and strength are ob-  
 “ tained by forming each beam of two bars, separated and  
 “ trussed where the frame or body of the plough is affixed.”

Secondly, in a “ mode of arranging the nose piece or lever  
 “ upon which the share is fixed by making it moveable upon a  
 “ centre pin, and having a screw passing through it, and also  
 “ through a chace mortice in the frame of the plough;” upon  
 “ this screw are three nuts, one of which fixes it fast in any



" part of the mortice in the frame, and thus regulates the dip  
 " pitch of the share; the other two embrace the lever, and  
 " according as they are moved alter the lateral inclination of  
 " the share to the frame of the plough."

Thirdly, in a mode of fastening the coulter to the double-beam plough, by causing it to pass through eye bolts fixed to a casting, which has motion on an axis through an arc of a circle, so that the inclination of the coulter can be varied and fixed by means of screws.

Fourthly, in a "mode of constructing horse rakes with revolving teeth," such teeth being curved and fitted upon a triangular piece. "Any required number of these pieces  
 " with teeth may be put upon the same axis;" the frame carrying the axis being capable of adjustment, so that the points of the teeth may be fixed to run at any required distance from the ground; a wheel upon the same axis has three spring catches, one of which rests against a stop, and when the lower row of teeth are full this spring catch may be raised by an attendant, whereby the wheel and axle will be caused to revolve until the next catch comes against the stop, when another row of teeth are brought into action, and so on continually.

Fifthly, in a mode of forming whippetrees "by uniting two  
 " pieces of iron at the ends, and separating them in the  
 " middle," "and although," the patentees say, "we usually  
 " construct open framed trusses in the making of whipple-  
 " trees according to this part of our invention, we can obtain  
 " exceedingly light and strong iron whippetrees by forming  
 " them of two hollow diminishing figures, fixed together at  
 " their base."

Sixthly, in a "mode of combining the parts of a horse power,  
 " for giving motion to thrashing and other agricultural ma-  
 " chinery."

Seventhly, in a "mode of applying the beaters of thrashing  
 " machines."

Eighthly, in "the application of an endless net or reticulate  
 " belt for receiving and shaking the straw and corn as they  
 " fall from a thrashing machine."

Ninthly, in a "mode of constructing sliding shifting for  
 " communicating motion to thrashing and other machines for  
 " agricultural purposes."

Tenthly, in forming the frame of a scarifier "of a combination of cast iron for the ends; and wrought angle iron connecting bars upon which the tines are fixed," in such manner as to be "capable of adjustment either in a perpendicular or lateral direction;" also in suspending the frames from two levers, the fulcra of which are upon a straight bar, forming the axis of the carrying wheels, whereby the frame may be raised or depressed, the levers being kept at the required height by a spring catch acting in notches in cast end frames.

And, eleventhly, in a "mode of constructing drain or sub-soil ploughs by applying screws combined with suitable apparatus," such screw being caused to revolve by turning handles, the axis of which is connected by bevelled wheels with the axis of the screw, and the apparatus is so arranged that "as it bores the earth parallel with the surface, or nearly so, it draws along the coulter and inclined plane, throwing out the furrow slice."

(Printed, 2s. 10d. Drawings. See Repertory of Arts, vol. 4 (enlarged series), p. 113.)

A.D. 1843, November 16.—No. 9943.

SMYTH, JAMES.—This invention relates to "improvements in the construction of drills for sowing grain, seeds, and manure," and consists, first, in "applying iron for the side framing of drills, whereby the requisite strength may be obtained, and yet allow the wheels to stand vertically or only slightly inclined, compared with the state of circumstances heretofore consequent on the use of wood for the side framing of drills; also in the making of the ends of the manure seed boxes with iron."

Secondly, in a "mode of arranging the bearings in respect to the wheels of the axis" "of the apparatus for feeding the drill with measured quantities of seed and manure." The wheel on this axis is driven, as heretofore, by a cog wheel affixed on one of the running wheels, and, as its relation in respect to that wheel has to be varied, several such wheels are provided with moveable bearings to adjust the axis, "in such manner that the drill cannot be put to work unless the proper bearings be used when a particular size of wheel is applied." In the side frames are made openings with grooves for receiving these bearings, which "are made cor-

"rectly for only one wheel," each wheel being marked to correspond with its particular bearings.

Thirdly, in a "mode of arranging the revolving apparatus "for delivering the manure at intervals," this apparatus consisting of several curved surfaces, which receive the manure from the cups, and by revolving deliver the manure at intervals apart.

Fourthly, in a "mode of arranging apparatus whereby the "seed can be delivered, together with or separate from the "manure, and the earth covered over the manure before the "seed is sown." "This is accomplished by means of a flap "or door," which is hinged so that it can close the opening into the manure drill, and cause the opening into the seed drill to be open; "or the door may leave the opening" "open, so "that the seed may descend with the manure through the "seed drill." In case the manure is required to be covered before the seed is sown, then between the manure drill and the seed drill is applied a "forked apparatus," which enters the "earth on either side of the furrow made by a manure drill, "and thus causes part of the earth to descend into the furrow "and cover the manure."

Fifthly, in a "mode of sowing seed from two different compartments by the same drill, by two sets of cups being "affixed on the same axis, and moving in two separate compartments."

[Printed, 1s. 10d. Drawings. See *Mechanics' Magazine*, vol. 40, p. 337.]

A.D. 1843, November 25.--No. 9030.

GARRETT, RICHARD.--The invention relates, first, to "an "improved arrangement of parts constituting a 'drop drill,' "with which seed and manure may be dropped at intervals in "patches, and a sufficient quantity of mould covered over the "manure before the seed is deposited upon it." The manure is fed to the manure pipes in proper quantities by means of "peculiarly-shaped scoops," and the lower end of the lowest manure pipe rests on a table, which is fixed in any convenient manner to the coulter, an opening being left between the coulter and the table down which the manure as it falls on the table is pushed on to the ground "by means of a vibratory or "reciprocating action which is communicated to the lowest "manure pipe" through the intervention of a connecting rod

from an eccentric on a shaft, which derives motion through gear work from the axle of the running wheels; or in place of the eccentric and shaft, the required motion may be communicated to the manure pipe by means of a lever and tappet; a fork behind the manure pipe "is mounted for the purpose of covering the manure over with mould previously to the seed being deposited thereon." The seed pipes, which follow the manure pipes and fork, are supplied with seed in the ordinary manner by cups, and the lowest pipe is furnished with a valve "formed of a cylinder with a portion of its circumference cut away, so as to form a recess for containing the seed," the axle of which valve is cranked, and is worked backwards and forwards by means of a rod, which is connected either to the lowest manure pipe, or to the rod which connects the manure pipe with the before-mentioned eccentric on a shaft; the seed pipe is preceded by a coulter, and followed by a small harrow for covering over the seed. The inventor remarks, "I do not intend to confine myself to the precise arrangement of parts herein shown and described, as other mechanical combinations may be employed, and considerable modifications may doubtless be made without departing from the principle of my invention."

Secondly, the invention "relates to machinery for threshing or beating out grain or seeds."

And, thirdly, to "an improved arrangement of parts constituting a chaff-cutting engine."

[Printed, 18 3d Drawings. See Repertory of Arts vol. 3 (enlarged series), p. 52. London Journal (Newton's), v. l. 24 (condensed series), p. 408, and Mechanics Magazine, vol. 31, p. 49.]

A.D. 1843, December 8.—No. 9984.

VINGOE, HENRY, and VINGOE, WILLIAM HENRY.—The invention consists in "the arrangement, construction, and combinations" of a "machine for planting or setting, drilling or dibbling," seed and manure. At the front part of a framework, carried by two wheels, is placed a box, for the purpose of containing manure sufficiently fine to pass freely, under the action of a series of notched wheels, carried upon an axle, which is continued through the manure-box, and derives motion through gear work from the running wheels, into and through descending tubes, whence it is "deposited in a con-

"stant and unremitting fall and in uniform quantity" into "small equal parallel and equidistant continuous drills or "trenches," formed in the ground by a roller with projecting edges, the axle of which is carried by an iron bracket in the front of the machine, and is raised or lowered by a compound lever handle. On the hinder part of the framework is placed a seed-delivery box, the bottom of which consists of "a frame of slides having a meter for the seed," which slide, during the progress of the machine, receives a "jerked and forward movement" from a notched wheel on the axle of the running wheels, the tension of a moderately strong helical spring serving to force the slide back into its place, whilst "bars" cover the apertures formed in the bottom of the machine, with small brushes to regulate the delivery of the seed by the slides, and a "movable bottom," divided into compartments, "is placed in the hopper resting on the bars, with corresponding holes" over the holes in the slide, whilst pipes serve to conduct the seed into the rills or trenches previously formed in the ground by the before-mentioned roller; these pipes are closely followed by a series of hoes revolving upon an axle, which is kept stationary by springs acting against a stud in such manner that, when the hoes become clogged, the springs allow them to revolve and clear themselves; "a flat-tired castor wheel" follows the hoes, and, by means of a handle, enables the operator to guide the machine.

The construction of the carrying wheels of this machine is peculiar, each wheel with its axle being mounted between longitudinal iron or wood beams, connected together by cross bars, and having "friction rollers enclosed in the boxes of the beams"; the invention includes their "use and application to agricultural implements and tools requiring travelling wheels, and to wheel carriages generally."

[Printed 1867. Drawings.]

A.D. 1843, December 28.—No. 9998.

LOWCOOK, HENRY.—This invention "relates to improvements in that class of ploughs which going up and down a field cause the land of the furrows as they are made to be turned over in the same direction, in consequence of there being two cutters and two shares, one of each at either end,

"and the draft being applied alternately to either end of the beam." The improvements consist, firstly, in "the application of the double mould boards or plates on an axis." The body of the plough has an opening formed therein to receive the double mould board or plates, which turn on an axis, "and in such manner that the inner end of the plates" "will rest against the outer parts of the opening through the body of the plough; therefore the mould boards or plates" "will be well supported, and will not prejudicially press on the axis."

Secondly, in "the forming the lower surfaces of the plough, so that when one is in the action the other may be off the bottom of the furrow."

Thirdly, in the so forming and applying surfaces, that "the land side of the plough will rest only by the middle" "of two inclined planes, and not from end to end of the land side of the plough"; and this construction is necessary "in order that the great length of the body of the plough necessary to this construction may not, as heretofore, offer so great a resistance by rubbing and moving against the land side of the furrow."

Fourthly, in a mode of constructing the beam by means of "two side plates of iron, having wood between them, there being openings through the wood for the coulters and for the stems which carry the bearings of the wheels, and also for the passage of the projections on the upper part of the body of the plough."

[Printed, 1844. Drawings. See Repertory of Arts, vol. 4 (enlarged series), p. 265.]

A. D. 1844, April 2.—No. 10,135.

STACE, WILLIAM, and VALLANCE, PHILLIP.—"Applying power for drawing and working ploughs and other implements."

The Specification describes a method of ploughing by the power of wind-mills. A wind-mill is set up at each end of two opposite corners of a field. These are made to drive an endless rope which is led over pulleys suitably placed at opposite sides of the field, so that a plough or other implement may be drawn backwards and forwards by either side of the rope. The pulleys are mounted on beams, anchored to the ground, so that they can be moved along the headlands. The ploughs are



wheel ploughs of any suitable character. They may be attached to the rope by any method allowing easy detachment, preferably by a pair of nippers which grip the rope, and are held tight by the strain of the plough upon them. The plough can be detached by slipping a ring off the point of a hinged hook which then falls open, and the strain being taken off the nippers, they release the rope. A particular sort of windmill preferred is described, but any sort may be employed.

(Printed, 2s. Drawings.)

A. D. 1844, April 30.—No. 10,172.

CAMBRIDGE, WILLIAM COLBORNE.—The first part of this invention relates to "an improved machine or apparatus for rolling ground and crushing or breaking clods or large lumps of earth," the principal features of novelty consisting, first, in the construction of the pressing wheels, which are placed at any convenient distance apart on an axle, so as to allow them to turn independent of each other," and which have their peripheries indented, or have teeth formed thereon "of a conical or pyramidal shape"; and, secondly, in the adaptation or application of running wheels, which are mounted upon the cast-iron framing of the machine, "for the purpose of facilitating the removal of the machine from one place to another, which is effected by simply turning the shafts over, and thereby inverting the position of the machine, and bringing the running wheels "on to the ground, so as to raise the pressing wheels "therefrom. "From the peculiar form of the teeth of the pressing wheels," the patentee says, "I am enabled to employ this machine for dibbling or making holes in the ground for the purpose of receiving seed." "A clod crusher" is shown in the drawings, "in which the crushing wheels are made with plain or merely angular peripheries instead of the indented ones." Secondly, the invention relates to "an improved construction or arrangement of parts," and to "the mode of driving or actuating engines or machines employed for cutting hay, straw, and other agricultural produce." Thirdly, to "certain improvements in machinery for thrashing corn." And, lastly, to "a novel combination or arrangement of mechanical parts constituting an engine to be employed for driving various descriptions of machinery by horse power or manual labour."

(Printed, 2s. Drawings.)

A.D. 1844, July 3.—No 10,241.

**SMITH, HENRY.**—This invention relates, first, to improvements in horse and hand rakes. The improvements claimed as new under this head of the invention are, —

"First, constructing hand rakes with moveable teeth or tines, that is, with teeth placed on a shaft independent of each other, and mounting the implement upon running wheels, and also raising the teeth of hand rakes from the ground by means of levers."

"Secondly, the peculiar arrangement of levers for effecting the same object as applied to horse rakes;" the levers by which the teeth are raised turning on the horizontal shaft upon which the teeth are separately fixed, and being so arranged as to have their inner ends acted upon and depressed by other levers, which are not connected by any joint to the former levers, but simply bear against their upper edges, when the shaft, on which the second set of levers are mounted, is acted upon by a hand lever; "also placing the teeth or tines of both horse and hand rakes in the front part of the machine, whereby," the patentee says, "I am enabled to gather or collect and carry away dead leaves, twitch sticks, and other extraneous matters."

The second part of the invention relates to improvements in machinery for cutting chaff, and also to various improved modes of driving the said machinery.

[Printed, 3s. 4d. Drawings.]

A.D. 1844, October 17.—No. 10,356.

**MABERLY, FREDERICK HERBERT, GEARY, STEPHEN, and CROUCHER, JOSEPH.**—"Apparatus for clearing, and cleaning, watering, breaking up, and raking of streets, roads, lands, and other ways."

Several machines for road sweeping, &c. are described. There is also a rotary harrow, and a machine for breaking up land. In the former a circular harrow is set on a vertical shaft mounted in a frame and rotated by gearing from the axle of the running wheels. The harrow can be raised from the ground by a lever, and has a spring on its shaft to enable it to yield to inequalities of the surface.

In the second machine a number of long handled picks are

parallel loosely on the axle of the running wheels. These are raised by wipers on a transverse shaft behind depressing the ends of their handles, springs are applied so as to drive the jacks into the ground as the wipers release their ends. The wiper shaft is rotated rapidly by a pinion thereon gearing with a large cog-wheel on the axle of the running wheels.

There is also a combined roller and brush, not apparently applicable to agricultural purposes. A toothed wheel on the end face of the roller gives motion to a rotary brush, which sweeps into a receptacle in front of it.

Also a method of tilting a cart is described, by means of a vertical screw passing through the fore-board apparently of the cart in front, supported by a wheel and having on it a screw with which a cart fixed to the screw engages. By rotating this cart by means of a wind handle and pulley, the cart is tilted.

*Patent is a Design.*

A.D. 1884, November 18.—No. 16,442

**KENTALL, FRANK B. (By Wm. H. Kentall).**—Improvement in a machine for separating the seed from the straw and chaff of grain. The object of the invention is to provide a machine for separating the seed from the straw and chaff of grain, and for cleaning the seed. The machine consists of a hopper for the grain, a series of rollers for separating the seed from the straw and chaff, and a series of brushes for cleaning the seed. The rollers are arranged in a series of three, and the brushes are arranged in a series of two. The grain is fed into the hopper, and the rollers separate the seed from the straw and chaff. The seed then falls into the brushes, which clean it. The cleaned seed is then discharged from the machine.

The object of the invention is to provide a machine for separating the seed from the straw and chaff of grain, and for cleaning the seed. The machine consists of a hopper for the grain, a series of rollers for separating the seed from the straw and chaff, and a series of brushes for cleaning the seed. The rollers are arranged in a series of three, and the brushes are arranged in a series of two. The grain is fed into the hopper, and the rollers separate the seed from the straw and chaff. The seed then falls into the brushes, which clean it. The cleaned seed is then discharged from the machine.

of the implement, when it will discharge its contents down a channel on to the ground.

With respect to the third-described implement, the inventor claims as new "a revolving disc, in the periphery of which " cups or recesses are formed for holding grain or seed," but only "when such disc is applied to hand-droppers."

"And, lastly, with respect to the above-described implements," the inventor says, "I claim the application of a " flexible tube or bag for supplying the same with grain or seed."

(Printed, 10d. Drawing. See London Journal (*Newton's* vol. 27 (*Continued series*), p. 9.)

A. D. 1845, January 21.—No. 10,483.

**SELLER, JOHN.**—"Improvements in machinery to be used " for drain cutting and subsoiling." Knives fixed on an axis to which, as the machinery is drawn forward, revolving motion is communicated from the axis of the fore wheels, serve to cut away the earth, which, when the machine is used for drain cutting, is raised out of the trench thus formed, by means of an endless belt, plates on which cause the cut earth to be moved up an inclined plane, and to ascend into a trough, whence it is thrown off laterally; such endless belt being put in motion by means of an endless strap, connecting the axis, to which is affixed the wheel carrying the endless belt, with a pulley or drum on another axis, which derives motion from the axis of the fore wheels." "In place of the arrangement " of rotatory cutters shewn, other arrangements may be used " provided that by their revolution they cut away the earth " as the machinery is moved forward;" or, in place of the endless belt, "an inclined screw may be used so as to raise " the earth as it is cut, and deliver it at the spout; the inclined plane in this case will be hollow, to correspond with " the screw;" the inventor, however, only claims the use of the screw or the endless band when combined with machinery for drain cutting. In order to obtain sufficient holding of the land, the two fore wheels of the machinery are connected with the two hind wheels by means of two endless chains, having projections formed thereon, which enter the surface of the land. Large carrying wheels and other arrangements are provided, whereby the machinery may be raised above the surface of the land, and transported from one place to another.

[Printed, 10d. Drawing.]

A.D. 1845, February, 20.—No. 10,525.

WEATHERSTONE, JOHN.—“An improved dibbling machine for planting seed or grain.” A series of compound circular discs or wheels are set upon the cylindrical part of a common axle; each disc having a series of hollow dibblers, the lower termination of each of which is closed by a moveable plug, projecting at equal distances around its periphery; each plug, as the dibblers penetrate the ground in succession with the progressive advance of the whole machine, being lifted from its lower or closing position by a sector rack, which gears with a straight rack formed on the upper extremity of each plug, and which is thrown into action, so as to raise the plug, by “a projecting stud” “fixed on a concentric and central circular disc,” which is set independently at its centre upon a square portion of the axle of the series of discs, whilst a segmental circular bar fixed on the same disc serves, by its extremity coming in contact with the projecting shoulder of each sector rack, to throw them in succession back to the closed position; the opening and closing of each dibble in succession as it penetrates the ground operating the deposition of the seed, which is supplied from the hopper to receptacles in the dibbles by a delivery wheel, as the machine advances.

A modification of the above machine is described, wherein sectoral pieces or cams, in place of the sector racks, have each one tooth engaged in an indentation in each plug, whilst each plug has another indentation and slope side formed in one of its edges acting against the concave curve of a lever, which is hung on a centre pin; so that, when the plug is thrust downward by the action of the sectoral piece, the lower extremity of the lever is thrust out, and the double purpose is effected of thrusting the seed out of the dibble, and also of opening the lower end of the dibble to admit of its passage therefrom.

Another modification is described, wherein a fixed iron plate forms one side of the dibble, and a moveable iron plate, having its motion on a centre pin, forms the other; whilst the circular and progressive motion of a radial bar on the axis of the dibble wheel causes the extremity of the bar to press upon a friction roller and stud fixed upon the plug, whereby the plug is depressed, and detents thereon, acting upon the curved edges of the moveable iron plate, lay open the lower point of the

#### DIVISION I.—FIELD IMPLEMENTS.

dibble : the plug is then returned to its original position, and the dibble closed, "by the upward motion of a helical spring."

Another modification is described, wherein a ring of wood or other material is formed of a converging shape at its outer periphery, and the seed or grain passes from the hopper down channels or grooves formed upon the sides of this ring ; such channels terminating in openings, and being closed by spring plates, which are attached to the ring and are passed outwards in succession as action is given to slides or plungers in a downward direction, by arrangements similar to those before described, whereby the escape of the seed or grain from the machine is secured. The steel plates may, in place of being attached to the rings by screws, be mounted upon fulcra, and operated upon by springs attached to the ring.

A machine is described whereby seed and manure may be deposited in the ground simultaneously. Motion is communicated to wheels on the spindles of both a manure delivery wheel in the manure box, and a cup wheel in the seed box, from a wheel, which derives motion through gear work from a wheel revolving upon the ground, and having its periphery furnished with radial teeth ; several sets of such arrangements can be placed side by side on a common axle.

A modification of the seed and manure machine is described, wherein radial teeth formed on the periphery of a wheel, during its revolution, form holes for the reception of manure, and, at the same time, by acting upon a catch, open an outlet valve, which regulates the delivery of the manure from the hopper to the delivery pipe, whilst a similar wheel opens an outlet valve of the corn box ; the two wheels are connected together by parallel bars, which ensure their simultaneous action.

[Printed, 2s. Drawings.]

A.D. 1845, May 23.—No. 10,685.

COLEMAN, RICHARD.—The first part of this invention relates to "improvements in the construction of harrows," the first improvement consisting in forming an expanding harrow of longitudinal parallel bars, each suitably arranged for being combined with a wheel, a lever carrying the axis of which moves upon an axis, and is capable of being raised or lowered,



and fixed in any desired position by means of a pin put through it and a quadrant bar, the longitudinal bars being combined together by pin joints with a series of bars, and having chains attached to their ends, whereby they are fastened to the whippetrees, on the length of the chains depending the width, "from the narrowest to the widest state of expansion" of the harrow. Another improvement in harrows consists in mounting a harrow upon three wheels, which can be raised or lowered in respect to the frame, and the depth to which the teeth or tines shall penetrate thereby varied and set to the desired depth; and also in placing each of the tines on an axis or pin, which is passed through the tines and through projections on the frame, the upper ends of the stems of the tines passing through holes in another frame, "and according as" the frame is fixed more or less forward or backward so will "be the inclination of the stems of the tines or teeth."

The second part of this invention relates to the connecting or joining of hurdles by placing them at certain angles with respect to each other and then coupling them together, "so that" they will not require to have any feet or points driven into "the land, by which sheep-folds will be more readily formed" and removed from place to place."

*Drawings. See Repertory of Arts, vol. 7 (enlarged series), p. 23.]*

A.D. 1845, May 31.—No. 10,693.

NAYLOR, JOHN.—"Improvements in the machinery or apparatus for crushing, tearing, and pulverizing arable land," which consist:—

"First, in composing the total length of" a "spiked roller" or rollers of distinct portions and independent short lengths "of hollow cylinders of metal, each length being of the same diameter, and set on one and the same common axle, and placed in close contiguity to each other in the direction of their length, and having liberty of motion independent of each other, or occasionally they may be so fixed to each other," "as collectively to compose the longer and integral roller or rollers." The axes of these rollers (there being two lines or sets of rollers are placed in the same horizontal plane, and their distance apart may be adjusted within a limited distance."

"Secondly, the spikes of these rollers are so arranged or disposed about the circumference of the said rollers as that each spike is successively brought into action, instead of acting simultaneously as in the machines in common and known use, whereby the draught of the machine is rendered more easy, and the operations thereof are more effective than heretofore."

"Thirdly, the spikes of these rollers are caused to enter more or less deep into the earth, by furnishing the axles or axes upon which the said rollers containing the spikes are mounted and revolve, with the means of adjustment of their height, together with the frame in which they are held, this adjustment being effected by means of vertical racks, the lower ends of which are made fast to the frame supporting the said axles of the rollers, whilst the upper ends are moved through the agency of pinions fixed on the ends of a shaft, which is connected by bevelled wheels with a lever handle."

*Patent, and Drawing. See Repertory of Arts, vol. 7 (enlarged series), p. 274. London Journal (Newton's), vol. 27 (reassigned series), p. 421.*

A. D. 1845, June 28.—No. 10,730.

MORRIS, WILLIAM.—The first part of this invention relates to a machine for "tilling land," the operations of which, when the machine is at work, are as follow:—Two coulters, one a fixed coultter attached to the framing of the machine, and the other an adjustable coultter, the upper part of which passes through a hole in the framing, "scope, cut through, or divide the ground in an upward direction," whilst a "sock," which follows, and is connected to the sole of the plough, cuts through or divides the ground in a horizontal direction, the earth or ground so divided being then forced up or along an "inclined plane or mould board," which is also connected to the sole at its lower end, whilst its upper part is supported by a piece attached to the framing, "until it arrives at the termination or nearly so of the curved part thereof, when it will fall by its own gravity, and be deposited on one side of the trench or opening so formed." The patentee claims as his invention "the modes of arrangement, principles of construction, and general combination of parts" herein-before described, "whereby the loosened ground or earth is raised from off the surface of the unloosened portion thereof, as

"constituting improvements in the apparatus or machinery known and distinguished as ploughs for 'tilling land,' and more particularly calculated for subsoil ploughing." The drain is cut by successive operations of the plough, the coulter, &c. being altered as required. A "mould or super-seeder" consisting of a box on wheels, running on a wooden frame, is then placed in the trench, and the top of the drain filled in and rammed down hard. The "mould" is then removed further on and the process repeated.

[Printed, *1s. 6d.* Drawings.]

A.D. 1845, June 28.—No. 10,742.

NALDER, JAMES HALL.—"Improvements in drills for drilling corn, grain, and manure," which consist, first, in the arrangement of mechanism for transmitting motion from the axle of the carrying wheels to the apparatus for feeding the drills. On the said axis of the carrying wheels is fixed a toothed wheel, which takes into and drives a toothed wheel on a second axis, which is connected by an universal joint to a third axis, on which are two bevelled wheels, each of which is capable of being thrown out of gear with a bevelled toothed wheel on a fourth axis, which also has affixed on it a bevelled wheel, which takes into and drives a bevelled toothed wheel on a fixed axis, a toothed wheel on which gives motion to the feeding apparatus; this part of the invention, however, more particularly relates to the peculiar arrangement of the fourth axis, and means of giving motion thereto, and transmitting motion therefrom to the fifth axis.

Secondly, the invention consists in the use of a sliding plate, which is applied to the feeding apparatus, for the purpose of regulating the supply of seed to the cups, which sliding plate has affixed on it two racks, and can be raised or lowered by means of a handle affixed to an axis, on which are two toothed wheels which take into the said racks.

Thirdly, in a mode of constructing the seed cups, by making each cup of two parts, one part "being capable of movement so as to enlarge or decrease the size of the cup."

Fourthly, in applying "a series of bent blades" on the same axis as the ordinary manure cups, which blades "serve to cut portions of manure which are afterwards thrown forward by the cups."

[Printed, *2s. 6d.* Drawings.]

A.D. 1845, August 7.—No. 10,807.

**CRAWFORD, DALRYMPLE.** — "An improved dibbling machine," which "may be constructed so as either to be worked directly by hand or through the medium of wheelwork." A wooden staff terminates at bottom in a solid metal dibbling point, which is moved up and down through a hole in the bottom of a seed-depositing cup, which cup is, by means of two upright arms, attached to two slides, which move up and down in grooved bearings against the two sides of the staff; two tubes are attached to the sides of the staff immediately above the slides, and enclose rods, which are connected to spiral springs in the tops of the tubes, and exert an elastic pressure on the slides, and through them on the cup. The seed box, which is fixed to the front of the staff, is divided into an upper and under compartment by a false or shifting bottom. In this false bottom there is a seed hole, and in the fixed bottom of the box a similar seed hole, both which holes are opened or closed by means of two slides, moving to and fro on the top of the false and fixed bottoms respectively, each slide having a hole in it to coincide with the seed hole in its respective bottom. The angle pieces are attached to the two upright arms, which pieces as these arms are moved up and down press against the edges of the seed-box slides, and cause them to move from side to side. When the machine is forced downwards into the ground the angle pieces come into contact with the slide at the bottom of the box, and cause it to move sideways, till its seed hole coincides with the seed hole in the bottom of the box, when the seed falls into the cup around the dibbling point. The shaft being then pulled upwards, the seed drops from the cup into the hole made by the dibbling point, while the angle pieces, acting reversely against the slides, cause the bottom orifices to become closed, and the upper orifices to coincide, whereby a fresh supply of seed is delivered into the under chamber to be afterwards discharged into the ground by a repetition of the preceding process. The machine may be made to deposit seed and manure alternately by employing two sets of the above-described parts.

[Printed, 1845. Drawings. See *Mechanics' Magazine*, vol. 44, p. 146.]

A. D. 1845, August 9.—No. 10,810.

**BROWN, GEORGE.**—The invention "consists in the novel and " peculiar construction and arrangement of a plough, combining apparatus also for depositing guano, bone dust, or " other portable manure, and, lastly, the seed, at one operation."

Firstly, the improvements "consist in so constructing or " forming the plough into parts, that is, so dividing, arranging, " and setting the share of the plough that when drawn through " the land it shall form a ridge, by throwing the sole inwards " towards the centre of the machine instead of outwards, as " in all ploughs now commonly used."

"And, secondly, by this peculiar arrangement of the fundamental parts of the plough" the inventor is enabled "to " place the manure and seed boxes in the centre of the " machine, that is, in a line exactly over the centre of the furrow." As the plough is drawn forward through the land, the soil will be thrown inwards towards the centre by the peculiar set or arrangement of the double ploughshare, and the furrow will be formed immediately under the centre of the manure and rotary seed boxes, which are fixed upon the shaft of the larger pair of running wheels. There is a small toothed wheel which, being actuated by the locomotion of the running wheels, will through carrier pinions communicate rotary motion to the distributing roller in the manure box, and also give rotary motion to the seed box, so that both the manure and seed will be delivered as required. There is a sliding catch and hand lever provided for the purpose of throwing the toothed wheel out of gear with the manure and seed boxes when requisite. In sowing turnips or other small seeds a small roller is to be " attached to follow the seed as it is sown," and "if beans are " to be sown the small seed box must be removed and a large " seed hopper introduced in its place, and seed cups or " delivering wheels be put in place of the rotary seed boxes."

[Printed, &c. Drawings. See London Journal (Newton's), vol. 28 (continued series), p. 177.]

A. D. 1845, September 4.—No. 10,826.

**LAMPITT, CHARLES.**— "An improved dibbling machine," wherein the dibbles are fixed to and cast in the same piece with the rim of a large wheel, and have each a recess formed

on one side to allow a seed tumbler to fit therein; the seed tumblers have each an aperture in the bottom for the escape of the seed, and two inclined arms or levers cast upon the top, which levers during the rotation of the wheel are successively acted upon by rollers, one of which causes the tumbler to move round on a pin, and to discharge the seed therein contained through the now open aperture into the hole made by the dibble, whilst the other serves to close the tumbler after the latter has received a fresh supply of seed from the hopper. The axis of the opening roller is carried by a rod, the upper end whereof encircles an eccentric, which may be caused to make a portion of a revolution, and thereby to raise the eccentric rod and the roller, when it is desired to release the tumbler from the operation of the roller. A peculiar scraper working independently of the dibbles is employed with this machine; it is made fast to the end of a spindle deriving rotary motion from a toothed wheel on the arms of the large dibble wheel, and "consists of three radiating leaves," "the pitch of which is made to correspond with the pitch of the dibbles at the rim of the wheel," whilst the face of the scraper is made concave "to fit the rim of the wheel."

[Printed, 1s. 6d. Drawings.]

A.D. 1845, October 2.—No. 10,844.

ROSENBORG, FREDERIC, and MALAM, JOHN.—"Improvements in or apparatus for watering, manuring, and drying trees, plants, seeds, and roots, and for accelerating and improving the growth and produce of trees, plants, seeds, and roots," which consist, first, "of an improved method of infusing or diffusing through the ground in which the trees, plants, seeds, and roots are growing, either warm or cold water or steam, or manure, either in the form of gas or liquid or warm or cold air." This is effected by conveying under pressure warm or cold water, steam, or manure, "prepared and used either in the form of steam or a liquid, or in the form of gas," through perforated pipes, tubes, or channels, laid down at any suitable depth below the surface of the land. "In order to dry the earth around seeds or roots, and to evaporate the water or superabundant moisture from the soil," "hot or cold air" is caused "to be forced by pumps, fans, or



"any other convenient mode through the above described perforated pipes, which, by escaping therefrom into the adjacent ground, will find its way to the surface, and carry off a considerable quantity of moisture."

Secondly, the invention consists in passing "currents of electricity obtained from a high pressure steam boiler or boilers, or from a powerful battery" along "a series of wires, at a convenient and suitable depth in the ground, from whence the electricity diffuses itself among the seeds and roots, and materially assists and accelerates vegetation."

[Printed, &c. No Drawings. See London Journal (Newton's), vol. 29 (continued series), p. 185.]

A.D. 1845, October 6.—No. 10,853.

VAN OOST, AUGUSTUS JULIEN.—"Improvements in treating seed and in preparing materials used in fertilizing land, and for aiding vegetation."

1. Applying a coating of "sulphuro-azoted principles" to seed in order to assist germination. A solution of "gelatine, albumine, fibrine, or casein" is made, 2½ lbs. gelatine to 6 galls water. 2½ lbs. of the "meal of malt or wheat" is added, and the corn is steeped therein, after having been first moistened in a solution of "ammoniacal salt or of carbonate of potash at a density of ten degrees." The corn is then mixed with a powder of the following ingredients:—5 lbs. ashes such as come chemically nearest the ashes produced by burning of the plant whose seed is to be treated, 50 lbs. carbonate of lime, or lime slacked in the air, 1 lb. sulphate of iron, 25 lbs. ground bones, 25 lbs. "pidgeon dung," all mixed in a liquid composed of 6 galls water (or preferably stale urine) 1 lb. gelatine, ½ lb. sulphate of potash, ½ lb. carbonate of potash, ½ lb. phosphate of soda, ½ lb. nitrate of potash, ½ lb. "ammoniacal salt," ½ lb. sulphate of soda. The mixture is dried and reduced to powder; the seed coated with gelatine is then mixed therewith, so that every seed may receive a coating of the compound.

2. A special sort of manure is described.

[Printed, &c. No Drawings. See Repository of Arts, vol. 7 (enlarged series), p. 207; London Journal (Newton's), vol. 29 (continued series), p. 207.]

A.D. 1845, October 9.—No. 10,858.

**HARTES, ISAAC.**—"Certain improvements in machines or  
" machinery for rowing, sowing, and manuring land."  
[No Specification enrolled.]

A.D. 1845, November 11.—No. 10,934.

**VAUX, CHRISTOPHER.**—The invention relates, first, to the construction of harrows, and consists in combining with a revolving harrow a frame, through which the harrows can be raised and thereby cleaned. A circular harrow is placed, in such manner that it is capable of being raised or lowered, upon a vertical axis, upon which is also affixed a circular frame, with holes for the passage of the tines or teeth of the harrow; which vertical axis derives motion through gear work from the wheels which carry the machine. "It will be understood that  
" harrows thus constructed will have two motions in respect to  
" the land, first, that resulting from being drawn along; and,  
" secondly, the rotatory motion communicated to it, by which  
" the surface of the land will be more fully worked than by  
" simply drawing a harrow over the land." Secondly, to "an  
" arrangement of machinery for pulverizing and breaking  
" clods, and for pressing land with growing crops thereon,  
" breaking clods thereon." On a shaft, having a pinion  
upon it which gears with a cog-wheel fixed on one of the  
running wheels, are fixed cams or lifters, which work under  
side lever rods moving on axes at their hinder ends, whilst in  
the front they are attached by connecting rods to a sliding rail.  
" By this arrangement it will be seen that as the machine is  
" moved over the land the slide rail will be constantly raised  
" and lowered; hence the teeth or instruments applied thereto  
" will act according to their form on the surface of the land,"  
and instruments of any form may be used with this machine.

[Printed, 2s. Drawings.]

A.D. 1846, March 5.—No. 11,117.

**FULLER, JOHN.**—"Improvements in apparatus for sowing  
" corn and other seed." Near the bottom of a compartment  
which contains the seed is placed a cylinder, having "two or  
" more holes or recesses" "of different sizes, to allow of the  
" same cylinder being used for different seeds, in which case

" only one recess will be in a position to act at one time, the  
 " other being brought into position ; an apparatus or arm  
 " which moves the cylinder will be connected at different  
 " parts when either of the other recesses is to be brought  
 " into action ;" the seed is delivered by the cylinder into a  
 hopper or spout, from which it is dropped into holes formed  
 in the ground. The principal feature of novelty in this inven-  
 tion consists in " the mode of applying the handle and  
 " apparatus for giving motion to the cylinder, whereby the  
 " handle, being held in the hand of the person using the  
 " apparatus, the instrument for giving motion to the cylinder  
 " may be readily acted on by the thumb of the same hand ;"  
 such instrument or lever being connected, by means of a rod  
 or link, to " an arm affixed to the cylinder, which is weighted  
 " to bring the cylinder and apparatus back after being acted  
 " on, or in place of its being weighted it may be brought back  
 " by a spring."

Another arrangement of apparatus for performing a like  
 object is described, wherein motion is given to the cylinder  
 by the thumb acting on the upper end of a sliding instrument,  
 the lower end of which is thereby caused to come successively  
 against pins or projections placed round the cylinder ; the  
 sliding instrument being constantly pressed upwards by a  
 spring, whilst friction plates " press against the ends of the  
 " cylinder, and prevent it turning unless force be used." The  
 inventor does not confine himself to the details shewn, so long  
 as the peculiar character of the invention be retained.

(Printed &c. Drawings. See Repository of Arts, vol. 4. *enlarged series*),  
 t. 247. Patent Journal, vol. 1, p. 326. Engineers' and Architects' Journal,  
 vol. 9, p. 335.

A. D. 1846, June 29. — No. 11,273.

ANDERSON, Sir JAMES CALER. — "Improvements in obtain-  
 " ing motive power, and in applying it to propel carriages  
 " and vessels, and to the driving of machinery."

Among the various matters described in the Specification is  
 a method of ploughing by steam. The ploughs are connected  
 to the back of a carriage on which is mounted a steam engine  
 and winding drum. Round the drum a rope is passed, both  
 ends of which are led forward and attached to anchors of  
 special construction. The engine winds itself up to one of

these anchors, while the other anchor, as the rope attached thereto is slackened off, is drawn forward by horses, &c. Each anchor is mounted on a pair of wheels; a beam carried by the frame of the anchor projects backwards and has on it a blade which enters the ground; a second blade is fitted by a pin-joint to an arm pivotted to the axle of the wheels and projecting forward; this can be raised by an overhead lever on the frame linked to the end of the arm.

[Printed, *la. id.* Drawings.]

A.D. 1846, July 10.—No. 11,286.

BEART, ROBERT.—"Improvements in tilling land," which consist in "combining pulverising and cleansing toothed wheels" "with scarifying machinery." These wheels "are placed on a cylindrical shaft having a projecting rib," as the inventor prefers that "the surfaces of the pulverizing wheels should have a slight movement on the axis; but that when they are at work, except when the machine is turning, that they should be prevented in every way moving on their axis. The pulverizing and cleansing wheels are so arranged that they, by their teeth, may come into action on the land as the surface thereof is raised and rises up between the tines, and in such manner that the teeth of the pulverizing wheels will penetrate the raised surface of the land, and cause it to be broken, and will also assist in preventing the roots and other matters rising up the stems of the scarifying tines." The axis of the pulverizing wheels has its bearings in additional side lever frames, which are fixed to the side framing by necks or axes, and can be fixed and adjusted to the desired position by means of bolts, which enter between teeth in sector racks at the front ends of the side lever frames. The hind carrying wheels are mounted on a cranked axis, moving in bearings fixed to the bar or beam which carries the tines; and a screw axis, turning in bearings fixed to the frame, the nut of which is connected by a rod to an arm on the cranked axis, is employed to lower the carrying wheels and raise the tines, as well as the pulverizing wheels. "In some cases, when paring land, it may be desirable sometimes to have one of the hind wheels at a different elevation to the other with respect to the framing of the machine." An arrangement for this purpose is described, wherein a lever

(one to each wheel), supported by an axle carried by the framing, is connected to a bar, to which the axle of the wheel is affixed, and which is capable of sliding up and down through eyes in the framing. Hence, by the adjustment of the lever, the position of the bar, and the consequent height of the side framing will be regulated.

[Printed, *la. ed.* Drawings.]

A.D. 1846, July 14.—No. 11,291.

**GRIPENBERG, OBERST.**—"Improvements in machinery for sowing grain and other seed." A cylinder, containing the seed, is caused to revolve by means of a toothed wheel affixed to one end of its axle gearing with a toothed wheel on one of the running wheels, whilst to the other end of its axle is fitted a pin, which moves "an area and longi-meter, consisting of four cipher plates continually pointing out the areal extent of field sown." The cylinder is double, and the seed passes from the interior cylinder to the interstices through two holes furnished with two sorts of flaps, one of which opens itself towards the interstice, more or less, according to the quantity of seed at the time contained therein; "the other flap opens towards the concavity of the interior cylinder, more or less, in the proportion of the pressure which a curved iron pin," during the cylinders movement around its axle produces against an iron band "fitted to the bottom of the box in such a manner that it can be raised or lowered as required." A spring, fixed to the axle of the cylinder, and continually pressing upon the flap, causes the holes of the interior cylinder to be opened only so far as the iron band is raised; the interstice is by these means furnished with an equal quantity of seed, whence the seed passes through several rows of holes into an open box, with divisions corresponding with the rows of holes, and drops thence through channels, supported by springs fixed to the bottom of the box, into the tracks of ploughshares, and is then covered over with mould by another set of ploughshares, "constructed in such a manner that they must the space between the tracks of the fore plow shares." The holes in the exterior cylinder can be enlarged or diminished in size by the help of screws, which move in either direction a kind of iron belt, having around its circumference a number of parallel projecting iron rims, to which narrow slips of iron,

for the purpose of enlarging or diminishing the size of the holes, are fixed. "The plow shares can be moved as well in " a vertical direction as in a horizontal, for lessening or increasing the distances between the sowing rows." "The " elevation of the plow shares, and the conducting and forcing " them into the soil, may be performed either at the front or " hind part of the engine, or at either side of it," by means of a lifting apparatus. "A box for carrying manure may, " without difficulty, be applied to the hind part of the machine," and "from this box a contrivance may be made for " conducting the manure into the seed rows by channels, so " that the manure either becomes mixed with the seed, or " placed either above or underneath it, or upon the soil which " the hind plow shares turn over the seed." A harrow may, if desirable, be added to this machine.

[Printed, 1s. 6d. Drawings. See Patent Journal, vol. 2, p. 570.]

A.D. 1846, July 15.—No. 11,297.

BONSER, THOMAS, and PETTITT, EDWIN WATKINS WILLIAM WYNN.—"Certain improvements in machinery for tilling " land," which consist in employing for the purpose " tillers, " consisting of cutters, or prongs, or tines, either straight or " curved, attached at right angles to cylindrical shafts or " drums, and arranged spiral-wise round the same, but without limiting ourselves in any way as to the number of such " cutters, or prongs, or tines, and combined with suitable " wheel-work for giving a rotary and progressive motion to the " same."

[Printed, 8d. Drawing. See Patent Journal, vol. 2, p. 587; Mechanics' Magazine, vol. 44, p. 101.]

A.D. 1846, July 23.—No. 11,304.

OSBORN, JOHN TULLOH.—"Power machines or machinery " for tilling, draining and otherwise cultivating land."

1. Two locomotive engines are caused to traverse the land on temporary rails, laid in parallel lines at right angles to the direction in which the furrows are to run, the distance between the two lines of rails being from one hundred to two hundred yards. Each engine carries two drums on the side nearest to the other engine; and to these drums are attached chains or



the earth above the point, whilst two horizontal blades or knives take the earth at about three and six inches respectively above the share.

The last part of the invention relates to "the adjustment of plough beams, and consists in the application of collars and screw bolts;" the front bolt forms an axis upon which the beam turns, whilst the hinder bolt, which passes through a hole lengthened crossways of the frame, and is provided with collars, serves to adjust and fix the beam in any desired position.

[Printed, 18d. Drawings. See London Journal (Newton's), vol. 30 (continued series), p. 522.]

A.D. 1846, August 22.—No. 11,346.

GIBSON, MATTHEW. — "Machine for reaping and cutting grass," &c.

The machine is pushed forward by a horse harnessed in shafts behind. It is supported on four wheels, two in front and two behind. Motion is given from the axle-tree of the hind wheels through toothed gearing to a rotating cutter. This is shaped like a frustrum of an inverted cone, and is fitted with blades set at an angle to its radius in the direction of its motion. The shaft on which this cutter is mounted is hollow, and another shaft passes down through it. This is fixed to the frame carrying the front pair of wheels, which work under and within the cutter. By means of a screw on this shaft, the front part of the machine can be raised or lowered, so as to regulate the distance of the cutter from the ground. Also by turning the shaft on its axis, the front wheels are turned from side to side, and the machine steered. The front part of the machine is wedge-shaped, so as to guide the crop to one side and leave it in a swathe. A rake may be fitted to the side of the machine to collect this. By means of a lever, this rake can be raised when it has gathered sufficient, allowed to pass over the heap and again lowered. The cutter frame may be fitted with projecting pins as well as knives.

[Printed, 18d. Drawings. See Patent Journal, vol. 2, p. 666.]

A.D. 1847, January 19.—No. 11,636.

READ, JOHN. — "Implements for the cultivation of land."

[No specification enrolled.]

A.D. 1847, February 16.—No. 11,581.

**HOLLAND, PHILIP HENRY.** — "Improvements in applying  
" manure to land."

"The inventor says, "I make no claim to the use of liquid  
 " manure, nor do I claim the method of distributing it by  
 " means of hose or other pipes, by pumps, or otherwise, nor  
 " do I claim the use of fixed or moveable steam engines to  
 " work pumps for irrigation without the use of hose pipes.  
 " But what I claim is, the employment of a moveable steam  
 " engine and pumps floating in a boat or barge, or moved on  
 " wheels, for the purpose of distributing manure or other  
 " substances for the improvement of the land through hose or  
 " other pipes. I also claim the application of earthen pipes  
 " with screw joints, made in moulds, for the collection, dis-  
 " tribution, or removal of liquid manures, or of substances  
 " suspended in water."

[Printed, 4d. No Drawings. See Repertory of Arts, vol. 10 (*enlarged series*),  
 p. 350. London Journal (*Newton's*), vol. 31 (*conjoined series*), p. 125.]

A.D. 1847, March 23.—No. 11,688.

**SMITH, HENRY.**—The invention relates, first, to "a novel  
" construction of machine for cutting straw, hay, and other  
" vegetable matters into chaff or small pieces."

Secondly, to a drilling machine, wherein one improvement  
 " consists in conducting the seed down a rigid vibrating tube  
 " into the ground, whether such tube be applied to the side  
 " of the coulter or form part with the coulter;" the coulter  
 " tube is formed in two parts connected together by a joint,  
 " whereby "the lower part of the coulter tube is enabled to rise  
 " and fall according to the inequalities of the ground over  
 " which it is drawn."

Another improvement consists in a mode of suspending the  
 seed box so that it can swing freely upon a shaft, which is  
 mounted in the upper part of two curved brackets fixed to and  
 standing vertically upon the frame of the machine.

Thirdly, to a dibbling machine wherein the dibbles are  
 caused to descend into the ground through the action of cam  
 wheels, the shaft of which derives motion through gear work  
 from the carrying wheels; each cam is embraced by a bell-  
 crank lever, the ends whereof are provided with bowls or  
 rollers, whilst on either side of the crank lever, and attached

to the same shaft, is a spring lever, the other end of which clasps one of the dibbles between two collars or enlargements on the stem. The dibbles are arranged "in pairs between a " running wheel, having its bearings in a hanging frame," which wheel gives, through the medium of gear work, a continuous rotary motion to one pair of dibbles, whereby they are " enabled to produce clean dibbled holes, whatever be the " relative speed communicated unto the cams, which cause the " descent of the dibbles into the ground." The seed pipes in this machine are so arranged that "the supply of seed from " each box is regulated by a slide which is worked by levers" connected to and receiving motion from the before-mentioned spring lever, the lower end of the seed pipe being closed when the dibble is at its lowest position.

Fourthly, to a manure depositor, wherein revolving motion is communicated from one of the running wheels to a discharging roller, which extends from side to side at the bottom of the cart, and has "several series of teeth or angular studs " or small knives set round its periphery," whereby the manure "is conducted, cut, and forced out through an aperture " in the bottom of the cart," whilst another roller, which is driven in the opposite direction, is so placed that a series of bent arms extending from its periphery pass between the studs or knives of the first-described roller, and thereby clear it from any adhering matter, a series of scrapers fixed to the back of the cart serve the double purpose of scraping the bent arms and also of preventing the manure being thrown out at the back by the rotation of the roller. The manure trough is so placed on joints or pivots that by a system of leverage it is capable of being raised, or placed at any angle of inclination, for the purpose of shooting the manure on to the discharging rollers. The manure on passing through the opening in the bottom of the cart falls upon a barrel, which has several series of studs or bent arms set round it, and derives revolving motion from one of the running wheels, whereby the manure is distributed in a broad sheet over the ground; or when it is desired to deliver the manure in rows, a series of spouts or conductors may be employed in place of the barrel. The machine may be prepared for distributing pulverized manure by a mechanical contrivance, whereby the discharging roller " will be made to revolve in an opposite direction to that

" before described, and instead of cutting the manure will  
 " scrape it clean out of the curved conductor, and drive it  
 " through the aperture."

Fifthly, to "a machine for opening and spreading grass in  
 " making hay." The heads carrying the tines are supported  
 at their ends by radial bars from the axle. Each head has a  
 forked piece pressing against a spring (shown in the drawing  
 as carried by the arm next behind). By the action of this  
 spring the tines are kept extended. To raise and lower the  
 rake a rod is fixed eccentrically to a segment rack mounted in  
 front, and also to the boxes containing the reversing gear.  
 The segment rack being operated by a worm, the tine wheels  
 are carried round the axle of the bearing wheels, and raised  
 or lowered accordingly. Instead of the segment rack a longi-  
 tudinal rack with a pinion may be used.

Sixthly, to modes of manufacturing wheels. A skeleton of  
 the intended wheel, which is prepared by rivetting an iron  
 hoop to the outer ends of a series of tubular spokes, so arranged  
 as to converge to a centre, is to be laid flat upon a circular  
 plate; solid blocks of metal are to be placed between the  
 spokes, so as to confine them, and an outer plate is then to be  
 put upon them and screwed down tight. "By this means a  
 " mould is formed with a central recess, in which the nave of  
 " the wheel is to be cast. Suitable cores are then to be placed  
 " in this recess for the purpose of forming the box or socket  
 " for the axle, and also for lightening the nave by making  
 " parts of it hollow." A modification of this mode is described,  
 wherein the skeleton of the wheel is formed by bending a cir-  
 cular hoop of iron, and attaching thereto by rivets a series of  
 wrought-iron bars, which have each been so curved as to form  
 segment of the intended wheel, and joined together by means  
 of a tenon formed at one end of each bar being caused to fit  
 into a mortice hole formed at the angle or bend of the next  
 bar. The skeleton having been thus formed, the nave is cast  
 upon the spokes in the way before described.

[Printed, 2s. 2d. Drawings. See London Journal (*Voctan's*), vol. 51 (con-  
 joined series), p. 389, Patent Journal, vol. 3, p. 490.]

A.D. 1847, May 8.—No. 11,698.

BRYANT, Amos, and TOTHILL, RICHARD.—This invention  
 consists, first, in a "method or system of paring, trenching,  
 P. L. F

"and transposing" land; and, secondly, in an "improved" implement which is intended to be employed in the said "operations," and which, from its peculiar action, is termed a "transposing plough." This plough has a number of flat-bottomed ploughshares, of which the central one is of a triangular form, whilst all the others are semi-triangular with the blade on the inner side, a cutter being fixed immediately in front of each ploughshare. As the soil is turned up by the shares and cutters, when the plough is drawn along, it is gathered by an apron, within which revolves a "rotating shaft" armed with a number of short blades, "all curved in an outward direction, that is, in a direction inclined towards the open end of the apron, which blades serve not only to break open the soil still farther, but to throw it out sideways on to the adjoining land." The shares, cutters, apron, and rotating shaft can, by means of slotted segments, be fixed at any required degree of inclination. According to the method or system of cultivation claimed in this invention, the surface soil is pared off equal breadths of land, and thrown, by the lateral action of the rotating shaft, over the adjoining surface, these operations being continued till "a series of trenches filled with good soil are formed all on the same level (except the first), with breadths of bad or indifferent soil between them, also on the same level." A system of drainage for low lands is described, wherein the water is drained into a large tank, whence it is pumped out and carried by pipes to any convenient distance. A mode of preparing land for growing forest trees is also described, wherein the ground is first trenched, and the surface soil being cast into the trenches, the trees are planted therein.

[Printed, 1s. Drawing. See *Mechanics' Magazine*, vol. 47, p. 491.]

A.D. 1847, May 10.—No. 11,700.

MARTIN, JOHN.—"Draining cities, towns, and other inhabited places and lands."

Most of the Specifications deals with matters not connected with this series, but among other matters is a machine for cutting drains for agricultural purposes.

It consists of a box or receptacle which can be mounted on wheels for transport. It is to be filled with sand. Under-

neath a cutter is fitted, and behind this is an opening through which sand can fall into the trench formed by the cutter. In front there is a connection for a draught chain and behind are handles. The machine is intended to run on the ground "as a sledge." It is to be used for cutting cross drains running into the main trenches.

[Printed, 1867. Drawings. See Repository of Arts, vol. 11 (*enlarged series*), p. 1. Patent Journal, v. 1, 3, p. 306.]

A.D. 1847, June 19. — No. 11,758.

BICKES, FRANÇOIS HENRI, and HENRY, MEYER. — The invention consists "in treating, manuring, or preparing corn, seeds," and the roots of plants before being planted, and also plants and trees when planted, with certain solutions, one of which is applicable to each description of seed or plant, and afterwards, before the seed or root of the plant to be planted is dry, in treating the same with one of a number of dry compositions adapted to the requirements of different kinds of seeds and plants.

The solutions consist, —

A. — "One pound of glue or gelatine dissolved in six parts of cold water."

B. — One pound of crystallised or beetroot sugar, or molasses, dissolved in three to four ounces of boiling water.

C. — (For treating the tobacco plant only). The ashes from the combustion of one ounce of tobacco added to the extract of one hundred ounces of tobacco leaves.

D. — "One pound of glue or gelatine, one ounce and a half of saltpetre, three quarters of an ounce of common salt, and six pints of water."

E. — "One pound of glue, quarter of a pound of saltpetre, two ounces of common salt, and six pints of water."

F. — "One pound of glue, two ounces of saltpetre, one ounce of common salt, and six pints of water."

For all the solutions, except those marked B and C, glue or gelatine may be used indifferently. "A solution or composition to increase the capability of plants to attract humidity can be made by taking two ounces of carbonate of potash to one pound of glue."

The dry compositions consist of white or common clay, cinders, wood, ashes, turf ashes, &c. ("It would be still better



" and more effectual if the ashes of those plants which are to  
 " be prepared could be employed ";) charcoal, lime, plaster  
 of Paris, and resins (for firs and resinous trees only). A  
 perfume may be produced in trees or plants by adding from  
 " one to three drops of etheric oil, or amber, extract of vanilla,  
 " musk, &c.," to one pint of the solution applicable to the  
 particular tree or plant about to be treated; the quantity of  
 perfume may be increased when it is desired to aromatise  
 flowers. The patentees claim, in respect of this invention,  
 " the use and application of the substances, matters or things  
 " above stated, combined, and employed as herein-before  
 " particularly described, together with the method or methods,  
 " process or processes of treating, manuring, or preparing  
 " corn, seeds, plants, or trees."

(Printed, w/ No Drawings. See Repertory of Arts, vol. 11 (*enlarged series*),  
 p. 95; Patent Journal, vol. 3, p. 123.)

A.D. 1847, July 3.—No. 11,779.

HUDDART, GEORGE AUGUSTUS.—This invention consists,  
 first, in an improved construction of harrows. "A series of  
 " transverse shafts are mounted horizontally in the side frames,  
 " and enabled to turn loosely therein upon their pivots.  
 " These shafts " "are formed by the twisting square bars of  
 " iron into spiral figures; and in the two opposite faces of  
 " these bars series of spikes or tines " "are inserted;" the  
 stem of one spike being screwed into the socket of the opposite  
 spike, when inserted into a previously made hole in the bar.  
 " As the harrow advances, the points of the tines taking into  
 " the ground will cause the spiral shafts " "severally to  
 " revolve." "Flat knives or cutters" may, in place of spikes,  
 be "inserted into spiral bars by passing them through slots  
 " or sockets," and "fastened into the bars by screws." Another  
 modification of this implement is described, wherein  
 " a series of zig-zag or crank-formed bars " "are securely  
 " fixed in parallel positions to the side rails, and not allowed  
 " to revolve as in the preceding instances. Upon the angular  
 " parts of these zig-zag bars, which are there made cylindrical,  
 " a series of star wheels " "are mounted, and enabled to turn  
 " freely in oblique positions. These star wheels have a series  
 " of radial spikes, and each wheel is formed in two pieces,"  
 the two parts "being bolted together when mounted upon the  
 " bar."

Secondly, in an apparatus for loosening the earth at or below the roots of plants. An arched bracket piece is bolted to the under side of the beam, and extends laterally on each side thereof for the purpose of carrying two star wheels. "These wheels are formed with radial spokes or dibbling points projecting from the boss, and they are set at any convenient angle from a vertical line, and at such distance apart as will suit the width of the drill." "The points," as the implement is drawn along, "will enter the ground at an angle and loosen it at the side and beneath the roots of the plants."

Thirdly, "in applying to ploughs one or more extra coulters." These are "attached to the beam in any convenient way, and so arranged, both lengthwise and breadthwise of the plough, that their points shall form a diagonal line across the width of ground to be next ploughed up, and be equidistant from each other. The coulters" "are furnished with horizontal blades, which are welded or otherwise attached, at convenient distances apart, to the stem of the coulters."

When the ground is hard, it is proposed to employ a single additional coulters with two horizontal cutters. "This coulters" "is to be so attached to the beam of the plough as to cut through the middle of the breadth of earth between the adjoining furrow and the ordinary coulters."

(Printed, 14. Drawings. See London Journal (Newspaper), vol. 32 (continued series), p. 44.)

A.D. 1847, July 29.—No. 11,818.

PAUL, JOSEPH.—The invention relates, first, to "a mode of arranging machinery for cutting or forming drains." A capstan or windlass, actuated by horse or other power, serves to propel the machine, and at the same time to give rotary motion to a large wheel or drum, which has fixed upon its external circumference a number of teeth or cutters, and is supported by an axle turning in bearings upon levers, which are capable of being raised or lowered by a windlass.

Secondly, to "a mode of filling up the drains after the drain has been cut and the pipes laid therein," by means of a plough which has "two or more cutters or scrapers, adjustable to any required height," mounted upon an iron rod descending vertically from the beam; which cutters, when the

plough is placed in the drain and drawn by horses, scrape out a portion of the subsoil, whilst conlers, which follow the cutters, "cut away the upper angles of the drain, and throw the earth down into it, which nearly or quite fills the drain, according to the width and depth at which the conlers have been set." The cutters and conlers turn upon a centre, so that they can be lifted out of the way when it is desired to move the plough from place to place.

An apparatus for subsoling is described, wherein tines or teeth are bolted to a square shaft mounted upon adjustable levers, whilst the machine is propelled and worked in the same manner as the revolving drain cutter. "In this machine the teeth so act as to make their cut upwards, bringing up the subsoil in front of the axle, whereas in former machines the act was downwards, moving the land backwards."

(Printed, 1s. Drawings. See Repertory of Arts, vol. 12 (*enlarged series*), p. 363. Mechanics Magazine no. vol. 42, p. 323.)

A. D. 1847, September 30.—No. 11,879.

NICHOLLS, ROBERT HAWKINS. — "Improvements in machinery for distributing corn and other grain on land, and also for improvements in giving motion to agricultural and other machinery." A rod, worked by a lever handle, moves freely in a tube, and fits at its lower end an opening formed by a moveable mouthpiece fixed at the lower end of the tube. The seed box is situated in front of an opening formed in the tube, the seed being conveyed into the tube by means of a curved and cranked instrument having a moveable hollow cup at its upper end. This instrument is fixed on an axis, which, by means of a connecting rod, receives motion from the before-mentioned rod. "In using this machine the apparatus is carried in one hand by means of the handle," and on the instrument being brought down the mouthpieces are pressed into the earth; then the handle "is pressed down, which raises the rod," and thereby causes the curved instrument to turn upon its axis, and by its cup to "carry up seed and throw it into the tube," "down which it will descend, and remain till the rod " "is again raised, when it will fall through the mouthpiece into the hole in the land." The inventor specially claims the moveable mouthpiece, and the mode of constructing and working the curved instrument,

but he does not confine himself to the details as herein described so long as the peculiar character of the invention be retained. The inventor disclaims "all that part of the title which is contained in the following words:—'and also for 'improvements in giving motion to agricultural machinery.'"

[*Filed, 12 Drawings. See Repertory of Arts, vol. 12, (unclaimed series), p. 72, London Journal (Newton's), vol. 32, (unclaimed series), p. 445.*]

A.D. 1947, October 14.—No. 11,907.

**MILLIE, Sir JOHN SCOTT.**—"Machinery applicable to tillage, and for other agricultural purposes."

1. A machine for tilling land consists of a frame or carriage to which the ploughs, harrows, or other implements are to be attached. It has two sets of wheels, placed at right angles to each other; one set supporting the carriage while the implements are in action, and the other set, which can be lowered or raised, sustaining the carriage when it is shifted sideways, in order to bring the implements into operation upon a fresh portion of the land. On each side of the carriage there are two "square stave or skeleton drums," over which passes an endless railway, formed of wooden planks or wrought-iron plates lugged together, and on this the bearing wheels of the machine travel. A double mould or ridge plough is fixed to the carriage, so as to precede the wheels and clear a path for them. Motion is communicated from one of the bearing wheels, by toothed gearing, to an axle extending horizontally across the carriage. On this axle are fixed "radial or curved pins, similar to harrow tines, hoes, or other suitably shaped points for breaking up the land, and coulters or cutting irons to the frame to precede these revolving instruments."

The machine may be driven in various ways, preferably by a high-pressure steam engine fitted on the carriage frame. This drives a drum round which a rope is passed, this rope being kept distended by a grapnel on each side of the field. Instead of transverse wheels being employed for moving the machine sideways, the carriage may be hauled on a light platform, placed on rails at right angles to the bearing wheels, and moved sideways by a "contrivance similar to what are termed 'crabs' used by builders." "Or in order to render frequent operations of this kind the less necessary, shafts or arms may be extended at each side of these carriages, to which a

" variety of agricultural implements may be attached, and by  
" which means three ridges may be acted upon by the carriage  
" being moved backwards and forwards in the same tracks as  
" frequently as may be necessary for this purpose."

When the weight of the engine is too great for the nature or state of the land, the carriage is to be drawn across the field by a steam engine at each side, alternately winding up a rope or chain attached to the carriage; such engines moving on temporary rails along the headlands. Or only one steam engine may be used, with an endless rope passing round the engine drum or whelp wheel at one side of the field, and round a pulley, carried by a platform mounted on wheels at the other side. In some cases the carriage may be propelled by the power of horses or other animals, which should be harnessed so that they tread in the furrows, and for this purpose they are guided by ropes stretched across the field and passing over pulleys on the harness.

" The moveable rails and hauling apparatus, already  
" described, may be made applicable to carts or waggons for  
" levelling land by the removal of the soil from the higher  
" to the lower grounds, to water carts for the purposes of  
" irrigation, and to ordinary carts or waggons for the removal  
" of manure and such other loads as may be required for  
" agricultural purposes; and when such carts are propelled  
" by animal power they may be provided with these endless  
" rails."

2. A mowing machine is represented, consisting of a carriage furnished with two sets of wheels like that before described, but without the endless railway; in this instance, however, the machine travels on the transverse wheels in the act of mowing, and the other wheels are merely used to shift it previous to commencing a fresh cut. The scythe blades or cutters are attached to endless bands or chains, which pass round two broad pulleys on one side of the carriage. A steam engine gives motion to these pulleys, at the same time that it causes a whelp wheel to wind on a stretched rope, in order to draw the carriage sideways across the field; so that as the machine advances, the scythes, travelling at right angles to such onward motion, will cut down a portion of the crop equal in breadth to the length of the carriage.

*[Patented, 14 3d. Drawings. See Repository of Arts, vol. 11 (enlarged edition), p. 321, Patent Journal, vol. 4, p. 333.]*

A.D. 1847, October 14.—No. 11,911.

HARRADINE, JOHN THANG.—“An improved instrument for  
“ preparing land in various ways for agricultural purposes,  
“ consisting of a working frame for the attachment of suitable  
“ implements, mounted upon a travelling frame or carriage,  
“ the fore part of which rests upon an independent axletree,  
“ capable of being guided by a lever.” This lever extends  
from the hinder part or back of the instrument to the top of  
the fore part of the frame, where it is centred upon a bolt,  
and terminates in two curved arms, which descend, clasping  
the independent axletree between them, so that, on raising or  
depressing the handle of the lever, the axle is caused to turn  
horizontally upon its centre, and the instrument inclined to  
the right or to the left.

The invention includes also “the peculiar method of raising  
“ and lowering in their sockets the various implements, such  
“ as harrow tines, scarrifiers, coulters, and the like, attached  
“ to the working frame by means of a separate lever to the  
“ stem of each tool, and also the mode of retaining such  
“ implements at any required elevation in their sockets by  
“ means of a spring catch.”

Lastly, the invention includes “the application of a revolving  
“ sheath,” “whether applied to tines for harrowing or to  
“ other agricultural implements.” An improved tine, with its  
upper straight part furnished with a revolving sheath, is shewn  
in the drawings, the object of the improvement being to cause  
it to “work much cleaner than when the earth comes in  
“ contact with a fixed surface.”

[Printed, 10d. Drawing.]

A.D. 1847, November 25.—No. 11,977.

BARRAT, PIERRE PHILIPPE OÉLESTIN. — “Machinery for  
“ tilling and working land.” The machine consists of a steam  
carriage travelling on four broad wheels, and fitted at the hind  
end with a horizontal frame, containing two rows of mattocks  
or cutting instruments. The head of each mattock is forked  
or made with two curved teeth; and it is fixed to a straight  
handle, the opposite end whereof is inserted in a metal socket,  
which is mounted on a horizontal shaft in such manner as to  
be capable of turning freely thereon, in order that all the



mattocks may move independently of each other. Although all the sockets are mounted on the same shaft, the mattocks are arranged so as to work in two rows, by making the handles of two different lengths, and placing them alternately in the sockets. The mattocks of the foremost row enter the earth to the depth of from seven to twelve inches, according to the nature of soil, while those of the back row work in the place where the front mattocks had previously operated, and penetrate the earth to a greater depth. The shaft that carries the sockets has two movements, viz. a rectilinear motion to and from the carriage in guides carried by the horizontal frame, and an alternate circular motion. To the ends of the shaft are fixed two branch pieces connected by a cross bar; which bar, by the circular motion of the shaft, is caused at the proper time to press upon an arm that projects from each socket, and thereby to raise the mattocks after they have acted upon the earth, and to bring them into a position to operate upon a fresh surface as the carriage advances. When the mattocks have been raised into a nearly vertical position, they are permitted to fall, the action of the teeth in entering the earth being rendered more powerful than is due to their weight by the pressure of a large spring. As the teeth penetrate the soil, the shaft recedes from the carriage, and causes them to draw the loosened earth backwards. Some improvements in the steam engine are also described.

[Printed, 2s. 4d. Drawing. See Patent Journal, vol. 5, p. 53.]

A.D. 1847, December 1.—No. 11,983.

CHANDLER, THOMAS.—“Improvements in machinery for applying liquid manures.” Motion is communicated from the running wheels to an axis in the interior of the vessel, which contains the liquid manure. On this axis are fixed chain wheels for carrying chains of buckets, which, when the machine is in motion, stir and carry up the liquid manure, and shoot it into funnels or pipes. “Other convenient means may be resorted to for actuating suitable buckets for stirring, carrying up, and discharging liquid manure; or, in place of buckets, Archimedean screws may be employed, and receive motion from the wheels.” The vessel containing the liquid manure moves on axes or necks, and its position may be adjusted from time to time. A seed drill may be

combined with this machine, in which case it is carried by arms at the back and upper part of the liquid manure vessel, and motion is communicated to the axis of the drill apparatus from the axis in the interior of the liquid manure vessel; the seed being conducted, by funnels or tubes, to the liquid manure funnels, and deposited with the liquid manure. "The liquid drill may be used for applying liquid manure to growing crops sown in rows, as well as to applying liquid manure when drilling seeds." The patentee says "I do not confine myself to the details as shown provided the peculiar character of my invention be retained; and I would state, that so far as the seed drill shown and described, separately considered, I do not claim the same; but what I claim is, the combining parts into a machine, as described, for applying liquid manure. And I also claim the combining therewith a seed drill, so that seed and liquid manure may go together in the earth."

[Printed, 2s. 2d. Drawings. See Patent Journal, vol. 5, p. 56.]

A. D. 1847, December 7.—No. 11,986.

NEWINGTON, SAMUEL. — "Improvements in dibbling or sowing seed." The seed box consists of two side plates, which rise above the box, and are connected by a bar, which constitutes one of the handles of the machine; the side plates being also connected together by a plate, which forms the top of the seed box, and to which the dibbles are connected by means of screws. Through openings formed in this plate slide two uprights, which are combined together at the upper parts by a cross rail and a handle, and are connected at bottom by a rail, through which are openings for the passage of the dibbles. Two plates of metal are fastened on either side of the uprights, thereby enclosing the space between them, the plates and uprights being so arranged as to move freely through an opening formed at the bottom of the seed box. A seed carrier, having recesses formed in it, is fixed to uprights on the lower rail, and is just capable of moving up and down freely between the stems of the dibbles; and there are inclined surfaces, for the purpose of guiding the seed to the openings through which the dibbles pass, fixed on either side of the uprights. In using the apparatus, the instrument is to be held by both handles, and, by placing

the foot on a step, fixed at the front of the apparatus, the dibbles are to be pressed into the earth. The handle, or bar connecting the two side plates which rise above the seed box, is then to be raised, still keeping the rail trod down; "the effect of which will be, that any seed which may have been in the recesses of the seed carriers at the previous movement of the apparatus will by this means be released from the inclined surfaces," on which it has rested, and fall on other inclined surfaces, by which it will be guided to the openings through which the dibbles pass, and so into the earth. "By this movement the seed carrier will be brought below the seed in the box, and the seed will fall into the recesses thereof." The inventor says "I do not confine myself to the precise details shewn, so long as the peculiar character of the invention be retained; and although only two dibbles are shewn, apparatus according to my invention may be made with any number of dibbles. What I claim is, the mode of combining parts into an apparatus for dibbling or sowing seeds."

[*Printed, Ls. 8d. Drawings. See Patent Journal, vol. 3, p. 109; and vol. 9 p. 291.*]

A.D. 1848, March 8.—No. 12,086.

ROYCE, GEORGE. — The invention "consists, first, of improvements in machinery or apparatus for depositing corn and seed." Several shafts for depositing corn or seed, derive motion from an axis, on which are a number of wheels—one for each shaft across the machine,—which take into and drive pinions on the shafts, motion being communicated to this axis from the running wheels. At the lower end of each shaft is fixed a worm or screw, which, standing in front of the opening of the shoot, containing the supply of grain or seed, will by its revolution deposit the seed; there being a slide in front of such opening for the purpose of regulating the flow of seed to the screw. Manure may be deposited at the same time by this machine. In the manure depositing spouts are a series of inclined blades, fixed on axes, which derive motion from an axis, to which motion is also communicated from the running wheels; a supply of manure is kept up to the spouts by a revolving axis. Drill rows are made in the land by means of wheels; after each of the manure depositing spouts

follows a pressing wheel; "and after the seed depositing apparatus there are two wheels," with inclined surfaces, which cause the seed to be covered over.

"Secondly, "of improvements in machinery or apparatus for cleansing corn and seed."

Thirdly, "of improvements in machinery or apparatus for grinding corn and seed."

[Printed, 2s. 4d. Drawings. See Patent Journal, vol. 5, p. 433.]

A.D. 1848, March 11.—No. 12,093.

COODE, GEORGE. — An improved method of distributing liquids, &c. over land. The patentee says "I use for the purposes of my invention a distributor, which is of three several varieties, called *the parallel, the radial, and the diametral*, but are all constructed to a certain extent in the same way and on the same general principles. The apparatus in every case consists of two main parts: first, a delivery pipe, which is a long tube, perforated all over or in certain parts only, with holes for the delivery of the liquid or liquid matter, and which is made either of some rigid material, as metal or wood, or of some flexible fabric, as canvas, enclosed in a rigid framework or cradle; and, second, of a flexible hose for feeding the delivery pipe. When the pipe is of metal or of other substance, even and smooth on the inside, it is made of a strictly conical shape from the feeding place to its end; but when the delivery pipe is of wood, or of any substance absorbent, rough, or unequal on the interior surface, the friction of the liquid, or liquid substance on the inside of the tube, must be compensated by a proportionate enlargement of the tube towards the feeding end." In the case of the parallel distributor, the delivery pipe is moved in a direction at right angles to its axis, and is pierced with perforations of equal dimensions placed at equal distances." It may be supplied from the hose in two modes. In the first mode, the hose is made in convenient lengths, and the pieces are laid in succession on the surface to be watered, and in the direction in which the apparatus is to be moved; one end of the hose being connected with the source of supply of the liquid, whilst the other end is attached by a joint to the feeding end of the distributor. "The distributor being moved forward, drags

"with it the end of the hose, until the whole is pulled out straight," "when a compressor is put on it to prevent the further outflow of the liquid, and to enable the hose to be detached from the distributor, and connected with another joint of hose laid on as before." The compressor may consist either of "strong wire twisted into a rectangular form, with one end" "returned or nearly so to one of the shorter sides of the rectangle, so as to hold fast a tongue," "of similar wire, but of twice the strength, which turns in the short side of the rectangle;" or "of two metal jaws, hinged together, and capable of being brought tightly together by means of a screw." In the second mode, the delivery pipe carries a reel, round which a coil of hose is wound, one end of this hose being permanently connected with the delivery pipe, whilst the other end carries the male or female screw of an union joint. A hose is used to supply this distributor, and "at intervals, equal to the length of the hose coiled on the reel, there are T pieces, furnished with male or female screws, as the case may be, and at each T joint there is placed a compressor. The distributor being brought in succession to each T joint, and the coiled hose attached to it, the liquid or liquid substance flows through the coil into the implement, which is then moved on towards the next T joint, the coil unreeling as it advances." In the radial distributor, the delivery pipe is moved radially from a central point, its point of connection "with the feeding hose being the centre of the circle." In the diametral distributor, the delivery pipe "is placed at the middle on a standard, and moves on it as the diameter or double radius of a circle." The inventor claims "the distributing of liquids and substances in a liquid and fluid state by means of the three several arrangements" before described, "one or other, or all of them, and according to the peculiar method or methods also before described." He also claims "the use of conical delivery tubes, and of hose for coiling round reels," "for the distribution of liquids and liquid substances, whatever may be the method or methods according to which the same are employed."

[*British Pat. 11,841*. See *London Journal* (Newton's) vol. 35 (conjoined), p. 10. See also *Manchester Guardian*, vol. 46, p. 562. *Agricultural Journal*, vol. 7, p. 101. *Patent Journal*, vol. 6, p. 7.]

A.D. 1848, April 27.—No. 12,140.

**SALTER, ROGER GEORGE.**—The first part of the invention relates to "the attaching to carts for the distribution of liquid substances, of apparatus or machinery whereby the outflow is made dependent on the progression of the carts, and the width of space irrigated can be varied at pleasure." A piston and rod, to which motion is communicated through a piston, connecting rod, and way shaft, from a cog-wheel on the axle of the wheels of the cart, work within a cylinder, fixed horizontally beneath a "tank or cistern for holding the liquid substance to be distributed." The liquid substance is admitted from the tank into the cylinder through supply valves, and it is discharged through other valves from the cylinder into a delivery pipe, by which it is transmitted to "side or end distributing pipes." "The piston in its motion closes one of the supply valves" "and opens one of the discharge valves," "and vice versa, at every stroke; and by this alternating action the liquid substance is forced through the feed pipe" into the side distributing pipes. An air pipe or chamber preserves an equable pressure in the pipes, while three way cocks, which command the passages between the feed pipe and the side distributing pipes, "serve to regulate not only the quantity of liquid allowed to pass through to the side distributing pipes," but the width of the space irrigated. The motion of the piston and other machinery can be stopped by raising the connecting rod of the crank and throwing it out of gear, by means of a lever.

The second part of the invention relates to "the attaching to drains, sewers, cesspools, and other like conduits and receptacles, of apparatus or machinery whereby the same are rendered self-flushing."

[Printed, in 6d. Drawings. See *Mechanics' Magazine*, vol. 42, pp. 565 and 566, also vol. 51, p. 401; *Artizan*, vol. 7, p. 88; *Patent Journal*, vol. 6, p. 63.]

A.D. 1848, May 2.—No. 12,141.

**HARTES, ISAAC.**—"Certain improvements in machines or machinery for rowing, sowing, and manuring land." The body of the machine is divided into two compartments, one for manure, the other for seed. A roller spindle, the surface of which is studded with a set of projecting blades, which are



right side of the rectangle  
either, and capable  
means of a screw  
carries a reel, from  
of this hose the  
ery pipe, whilst the  
of an union joint  
tor, and "at the  
iled on the rev  
female screw  
ere is placed a  
succession to  
the liquid  
to the implement  
joint, the con  
ibrator, the deliv  
oint, its point of  
re centre of the  
ery pipe "is pla  
oves on it as the  
inventor claims "the  
a liquid and fluid  
rrangements" before  
hem, and according to

lower extremity, and which, when in the position, actuate a slide, whereby a measured quantity of seed is caused to escape from the upper part of a chamber which are contained the various parts of the machine, whence it falls by its own gravity into a hole or opening in the bottom of which is the presser, and thence, when the presser is moved by the handles, the seed passes into recessed or conical brasses, which are kept in close contact by springs, but which are forced asunder by the movement of the presser, and the seed thereby is pressed forcibly into the ground. The lower chamber may, however, be so arranged as to allow the seed to be dropped only into the hole formed for its passage, instead of being pressed into the soil." Another mode of dibbling is described, wherein the reservoir for the seed, as also the mode employed for actuating the presser, respects similar to the above-described machine, but the seed is discharged and deposited on the surface of the ground by the withdrawal of a slide, which closes the opening at the end of the dibble, and which is actuated by a lever or handle placed outside the metal tube.

Another mode of combining a number of the before-described dibbling apparatus in one machine, mounted upon a carriage and actuated by horse power; from one of which a running wheel motion is communicated to cranks, which, as the machine moves, impart the necessary movement to the dibbling wheels, whilst cams fixed upon the cranks serve to move the seed-holders and dibbles connected thereto through the ground, as that moved over by the running wheels." An arrangement is provided, whereby, in the event of one or other of the seed-holders and dibbles coming opposite to a hole or rut in the ground, the seed holder will be suspended in its position, the dibble continuing its descent, and the seed being deposited in their course, the rod "will be raised by the seed-holder, and thereby discharge and deposit the seed as if the rut or hole were not there." The machine may be adapted to the purpose of a seed drill, or a place of the dibbling apparatus, and may be connected with the two throw cranks, and combined that the crushing blades

made sufficiently long to pass a short distance through openings in the bottom of the manure compartment, derives motion from the running wheels; so that, when the machine is in motion, the manure "will drop out on the surface of the ground in " successive portions, smaller or larger, according to the " length of the blades." Another roller spindle, round the upper end of which works an endless belt or band, which is stretched at bottom by another roller, also drives motion from the running wheels. "To the outer surface of this band there " are attached a number of projecting pieces of metal," " which " pass at the point immediately over the roller " " into the " bottom of a spout leading from the seed box. " " Each of " these pieces of metal " " takes up a portion of the seed as " it passes under the spout, which again is regularly deposited " upon the ground as the endless belt revolves." These arrangements "are suitable for depositing both the manure " and the seed in successive portions, and not in one continuous stream." Another arrangement is described, wherein the endless band is dispensed with, and the revolving roller is placed nearer to the surface of the ground. In this case, underneath the terminations of the different seed spouts, the revolving roller is fitted with projecting blades, which "play the " same part in distributing the seed as the projecting pieces " upon the endless band. In some cases a revolving feed roller is placed in the bottom of the seed hopper to cause the seed to flow into the upper ends of the spouts. "To bring the " surface of the land, after it has been partially prepared, " into regular rows," the inventor says, "I employ a plough, " attached to the body of either of the machines before " described, and with cutters or mould boards placed in the " position with relation to each other, represented by the plan."

Printed, and Drawn. See London Journal (Newton's), vol. 23 (continued &c.), p. 327. Mechanics Magazine, vol. 40, p. 452. Artisan, vol. 7, p. 83; Patent Journal, vol. 6, p. 53.]

A.D. 1848, July 11.—No. 12,211.

ROSS, JESSE.—The invention consists, first, in "improvements in apparatus for dibbling, whereby the process of " dibbling and sowing or depositing seed or grain are effected " at one operation," by means of handles, which are connected to a rod or square piece of wood having a cylindrical shaped

presser affixed to its lower extremity, and which, when in the act of being pressed down, actuate a slide, whereby a measured quantity of seed is allowed to escape from the upper part of a metal tube, within which are contained the various parts of the dibbling machinery, whence it falls by its own gravity into a cup or casting, a hole or opening in the bottom of which is exactly closed by the presser, and thence, when the presser is withdrawn by the handles, the seed passes into recessed or cupped portions of two brasses, which are kept in close contact by means of helical springs, but which are forced asunder by the downward movement of the presser, and the seed thereby discharged and pressed forcibly into the ground. The lower part of this apparatus may, however, be so arranged as to allow the seed "to be dropped only into the hole formed for its reception, instead of being pressed into the soil." Another apparatus for dibbling is described, wherein the reservoir for seed, the measure, as also the mode employed for actuating the same, are in all respects similar to the above-described machine, but the seed is discharged and deposited on the surface of the ground by the withdrawal of a slide, which closes the opening at the lower end of the dibble, and which is actuated by a system of leverage placed outside the metal tube.

Secondly, in a mode of combining a number of the before-described dibbling apparatus in one machine, mounted upon wheels, and actuated by horse power; from one of which running wheels motion is communicated to cranks, which, as they rotate, impart the necessary movement to the dibbling machinery, whilst cams fixed upon the cranks serve to move the "seed-holders and dibbles connected thereto through the same space as that moved over by the running wheels." An arrangement is provided, whereby, in the event of one or other of the seed-holders and dibbles coming opposite to a hole or rut in the ground, the said holder will be suspended in its progress, "and the dibble continuing its descent, and the cranks continuing their course, the rod" "will be raised independently of the seed-holder, and thereby discharge and deposit its measure of seed as if the rut or hole were not there." This machine may be adapted to the purpose of a clod-cruasher, by substituting in place of the dibbling apparatus and attaching to one or both of the two throw cranks, clod-crushers so arranged and combined that the crushing blades

are placed crosswise of each other, and are caused by the rotation of the cranks to strike against the clods of earth beneath them.

Thirdly, in the application of the principle of construction described under the second head of the invention to the propelling of vessels.

And, lastly, in mechanical arrangements and combinations, "whereby the paddles or floats, when placed near the stern of a vessel, are caused to move at a quicker speed than those placed at the fore part of a vessel."

[Printed, 2s. 2d. Drawings. See *Practical Mechanic's Journal*, vol. 1, p. 27; *Artisan*, vol. 7, p. 132 and 134, *Patent Journal*, vol. 6, p. 175.]

A. D. 1849, February 28.—No. 12,496.

**BOUCICAULT, DION DE.**—The invention relates to a mode or modes "for transmitting, applying, and distributing liquid or fluid for the irrigation or saturation of land used for agricultural purposes." Trenches are cut in the land to depths from twelve to thirty-six inches, and at distances apart varying from six to twenty feet, or even more or less. The land before trenching must be naturally level, or else it must be "contoured levelled at such vertical distances as will afford a proper distance between the lines of trenching." Having prepared the land by cutting these trenches, it is then proposed to cut "a main trench of a similar depth with the aforesaid trenches, which main trench must be cut so as to intersect all the other trenches," but "must not be cut on any contour line but must be drawn from the top to the bottom of the incline in such a line as may secure a gradual and easy fall." In the said trenches are laid down ordinary drain pipes, or layers of coke, "any other good and fitting material for making a good conduit," and the trenches are then filled up, and the land restored to its original appearance. A reservoir, connected with the main trench, may be constructed upon any spot so that when a liquid is to be used for irrigating the soil it is elevated above the level of the bottom of the trenches. The main conduit being fed from the reservoir, will conduct the liquid to each of the other conduits, in which the liquid will lie on a perfect level and be generally distributed, and "drawn up to the surface by what is commonly called the capillary attraction existent in the soil and in vegetation."

“ Where a fluid lighter than atmospheric air is to be used  
 “ for the purpose before mentioned, the reservoir should be  
 “ constructed upon a spot below the level of the bottom of  
 “ the trenches;” “the fluid would then ascend, and be  
 “ evenly and generally distributed amongst and throughout  
 “ the trenches.” “ If it should become necessary to impede  
 “ the flow or pressure of the liquid or fluid in any particular  
 “ kind of conduit, then that conduit should be made smaller  
 “ in diameter.”

[Printed, 4d. No Drawings. See *Mechanics' Magazine*, vol. 51, p. 215;  
*Patent Journal*, vol. 7, p. 214.]

A. D. 1849, March 28.—No. 12,540.

SATCHELL, RICHARD. — “Improvements in machinery for  
 “ depositing seeds, and hoeing and working land.”

[No Specification enrolled.]

A. D. 1849, June 20.—No. 12,663.

CAMPBELL, ALEXANDER FRANCIS. — This invention relates  
 first, to the manufacture of wheels, and “consists of two  
 “ improvements;” “one wherein tie rods or bars are used  
 “ between the spokes,” such tie rods being fastened between  
 the end of the spokes and the ring or tire of the wheel; and  
 the other wherein a flexible ring or hoop, containing water or  
 other liquid, is applied around a wheel.

Secondly, to the manufacture of ploughs. The first improve-  
 ment under this head consists in affixing to the fore wheel  
 axle of a plough with three wheels, and without any sole or  
 sledge, a steering bar or lever handle, whereby the steering  
 of the plough is rendered easy. Another improvement consists  
 in “constructing the plough beam in two parts,” “in such a  
 “ manner that the fore end of the upper part may rest on  
 “ the fore axle, and the depth of ploughing be regulated by  
 “ the rise or fall of the lower beam.” Another improvement  
 consists in a “mode of keeping the ploughshare horizontal by  
 “ means of a side bar or stay, resting on the fore axle, having  
 “ two wheels with liberty for steering or locking; also the  
 “ use or application of a wheel on the land side of a plough  
 “ for the support thereof,” the axle of such wheel being  
 capable of adjustment, “so as to regulate the depth of the  
 ploughing. All these improvements may be combined in



one plough. They may also be "combined with a plough " having two shares back to back, so that it may be drawn " alternately at either end." They may also be "applied " to a fore and aft plough, with two moveable mould irons, " one right hand and the other left, so that one will be taken " off when the other is used, whilst the two tension shares " and coulter remain fixed." A mode is shewn of affixing a patent tension share, when the fore point is laid over the share, and also of affixing a patent tension coulter direct to the ploughbeam, whereby the coulter is strained from the point of the share, and helps to support it in the land.

Thirdly, to improvements in harrows, which "consist of " suspending the frame," "which carries the teeth or tynes, " forming a harrow, by means of rods from the carriage " frame on wheels in such manner that the harrow or frame " carrying the teeth shall at all times move parallel to the " carriage frame," "and, consequently, the teeth caused " to penetrate into or recede from the earth." The harrow frame may, by means of a chain and rollers, be raised or " lowered."

Fourthly, to improvements in steam boilers.

Fifthly, to improvements in propelling vessels.

[Printed, 3s. 4d. (Drawings. See *Mechanics' Magazine*, vol. 51, p. 616  
*Patent Journal*, vol. 5, p. 200.)]

A.D. 1849, July 7.—No. 12,698.

GARRETT, RICHARD.—The improvements comprised under the first head of this invention, relate to agricultural machinery, first, to pug mills.

Secondly, to horse hoes, and an "improved plan of steering " horse hoes and drills," by "the employment or application " of parallel bars or a parallel framing with which the blades " of horse hoes or the coulter of drills are connected by " means of suitable arms or levers which work independent " of each other, and may be steered or moved altogether in " right lines horizontally, right or left, instead of in curves " as formerly." These parallel bars slide upon two sets of rollers, which turn in bearings made in rocking frames mounted on a horizontal shaft. The inclination upwards or downwards of the cutting edges of the blades of hoes may be altered or changed, according to the nature of the ground, by

turning a shaft, by means of a hand wheel, which causes a worm on the shaft to turn the before-mentioned horizontal shaft, by means of a sector rack; for the roller frames and rollers, being mounted upon this shaft, will of course turn with it, and the inner part of the parallel framing, which rests upon these rollers, will be thereby raised or depressed by being caused to perform a portion of a rotation round the aforesaid shaft, and the inclination of the cutting blades of the bars may be thus altered at pleasure.

Thirdly, to "a novel arrangement or construction of parts, whereby the rollers and coulters of drills may be raised from the ground, and the delivering barrel thrown out of gear when desired." When it is required to turn the drill, the attendant pulls down a hand lever, which will, through the medium of another lever, lift the toothed wheel which works all the internal mechanism of the drill, out of gear with the driving wheel; at the same time the pressing rollers will, by means of a short lever, and two chains, one of which is attached at its lower end to horizontal shafts or bars to which the bearings of large rollers are secured, whilst the other is attached also at its lower end to long levers, which carry small rollers,—be lifted off the ground, and, as they rise, the horizontal shafts will come against the under sides of the coulters levers, and thereby lift them and the coulters at the same time.

Fourthly, to "the adaptation to broad-cast manure distributors of a grooved or toothed roller or grooved or toothed rollers, on to which the manure is delivered from the reservoir or box containing it, and which grooved or toothed roller or rollers, by their rotation, more evenly distribute the manure over the surface of the ground than when it is merely delivered down a spout without such appendages."

Fifthly, the improvements relate to thrashing machinery, and consist "in a novel mode of constructing the concave of thrashing machines, and also in an improved arrangement of parts, or mode of constructing portable thrashing machines, so that thrashing, winnowing, screening, and shaking may be performed at the same time."

"The second principal head" of this invention "relates to various improvements upon engines and boilers principally designed for agricultural purposes."

[Printed, &c. &c. Drawings. See *Mechanics' Magazine*, vol. 52, p. 32; *Patent Journal*, vol. 8, p. 121.]

A.D. 1849, July 18.—No. 12,710.

USHER, JAMES. "Machinery for tilling land."

This invention consists, first, in "mounting a series of ploughs in the same plane around an axis so that they shall come into action in succession" and, secondly, in "applying power to give rotatory motion to a series of ploughs or other instruments for tilling land, so that the resistance of the earth as the ploughs or other instruments enter and travel through it shall cause the machine to be propelled." The machine consists of a steam carriage, the fore part whereof is carried by a pair of ordinary wheels, and the hind part supported by a broad roller or cylinder and a pair of wheels of like diameter. The roller extends from one wheel to the other, and is fixed on the same axle, which is caused to rotate by gearing connected with the crank shaft of the engine and thus to impart a slow progressive motion to the carriage. The roller is removable at pleasure, so as to render the bearing parts suitable to the different stages of cultivation "to which the machine may be applied." A lever frame at the back of the carriage supports a transverse horizontal shaft, which is driven by gearing from the crank shaft at a greater speed than the hind axle: on this shaft five plates are fixed parallel to each other, and at equal distances apart. To each plate are attached three ploughs of a curved form, suitable for penetrating the soil in the opposite direction to that in which the machine is advancing, and for elevating and turning over portions thereof. The ploughs are so arranged with relation to each other that two ploughshares will not enter the earth at the same instant. If preferred each set may be carried by a separate shaft.

[Directed, 1847. Drawing, *S. & Repertory of Arts*, vol. 15 (*enlarged series*), p. 216. *Mechanics Magazine*, vol. 22, pp. 70 and 73. *Artizan*, vol. 10, p. 145. *Talent Journal*, vol. 8, p. 224.]

A.D. 1849, November 24.—No. 12,860.

GALLAWAY, GEORGE, and PURKIS, ROBERT ALLER. —  
"Apparatus for ploughing land."

The apparatus for ploughing consists of a locomotive steam carriage, to the hinder part of which is affixed an upright frame, carrying at the top a set of three pulleys keyed on a horizontal axle, and at the bottom, on each side, a similar set

of pulleys,—the three sets of pulleys standing in such position relatively to each other that an endless compound chain, which is distended over them, assumes the form of an equilateral triangle. Nine ploughs are affixed to the chain at equal distances apart longitudinally, and in such positions transversely of the chain that they stand in three parallel lines. When the chain is caused to travel round the pulleys by the power of the engine, the several ploughs of the three sets successively come into action, forming three parallel furrows while passing between the two lower sets of pulleys, and as the machine at the same time moves slowly onward, a number of short furrows are produced in a diagonal direction across the field. The rate of the progress of the machine, and the speed of the chains carrying the ploughs, are so calculated that the furrows do not interfere with one another, the machine having moved just clear of one furrow as the next share comes into operation. For convenience of transport, the frame is made to fold together. A modification of the machine is described in which the endless chain passes in a horizontal direction over two sets of pulleys, and only four ploughs are affixed to the chain. In some cases the patentees attach to the back of the machine a series of rollers, placed upon a horizontal shaft, so as to form a continuous roller for the purposes of rolling the land at the same time that it is being ploughed; or such roller may be used as the driving wheel of the machine.

[Printed, 12. Drawings. See *Mechanics' Magazine*, vol. 52, p. 437; *Practical Mechanics' Journal*, vol. 3, pp. 103 and 259, *Patent Journal*, vol. 9, p. 117.]

A.D. 1849, December 19.—No. 12,907.

WHITWORTH, JOSEPH.—"Apparatus applicable to agricultural and sanatory purposes," &c. Among the apparatus described is a reaping or mowing machine. This consists of a frame mounted on two pairs of wheels, the front pair being made to lock for the purpose of steering the machine. Midway between the fore and hind wheels a vertical shaft is mounted, carrying a circular cutter on its lower edge, the cutter being supported by arms curving down from the shaft so as to allow room for a castor wheel which supports the base of the shaft. This shaft is so arranged that the cutter projects at one side beyond the frame of the machine, the rest of its circumference being underneath the frame. The shaft is rotated by gearing

from one of the hind wheels. It, with the cutter, can be raised by a chain wound on a pulley on the upper part of the frame. "For cutting grass and other crops which require spreading" the cutter revolves in the direction of the progress of the "machine; for corn and other crops which do not require "spreading," it runs in the opposite direction. Instead of a circular cutter, curved scythe-like blades, carried by radial arms from the shaft, may be employed.

[Printed, 1s. 2d. Drawings. See *Mechanics' Magazine*, vol. 33, p. 316; *Artizan*, vol. 9, p. 268; *Patent Journal*, vol. 9, p. 269.]

A.D. 1850, January 11.—No. 12,921.

NEWINGTON, SAMUEL.—The invention relates, first, to the sowing and tilling of lands by means of a "hand dropping machine." A pipe or spout, the lower end of which falls within the cleft of the coulter, is inserted into a hole in the bottom of the seed box. On a plate, which oscillates upon a centre, and is provided with two holes or cup-shaped recesses, is formed a tail piece, which takes into one of a number of rectangular notches, formed in a plate affixed to one side of a bar, which has its bearings in slots formed in the framework, and to which an alternating motion is communicated by means of "two rose or crown wheels, with teeth "of a vandyck shape," affixed to the axle of the running wheels; so that, when this bar is made to oscillate by the machinery being wheeled over the surface of the ground, the seed recesses come alternately over the spout and drop their contents.

Secondly, to a modification of the said machine, whereby manure may be deposited instead of seed. In this case, a regulating plate or strip of metal—"which has its lower edge "serrated, so that as it vibrates it causes the manure to flow "in a regular and continuous stream from a longitudinal "opening formed in the bottom of the hopper,"—is affixed to one side of a sliding bar, which has its bearings in slots formed in the ends of the hopper, and has the same movements as the oscillating bar, to which it is connected by means of arms.

Thirdly, to a modification of the said machine, whereby seed and manure may be deposited at the same time. The manure hopper is provided with a sliding bar and regulating

plate, all as before described; and rose or crown wheels give motion to the vibrating bar, which again gives motion both to the sliding bar and to the vibrating cup plates of the seed boxes.

Fourthly, to "the application of the machine firstly herein-  
" before described, or any of the modifications thereof, or  
" any of the peculiar parts of the said machine or modifications,  
" to other machines for sowing, manuring, and cultivating  
" land."

Fifthly, to improvements in a subsoil pulveriser, wherein a slotted guide bar, to which coulters or tines are attached, is attached to the beam and the lower end of the handles "by means of an iron clip," which admits of the slotted bar or guide being raised or lowered to any suitable height accordingly "as it is desired to make them enter to a greater or less depth."  
" This implement last described may also be employed for  
" hoeing purposes, or for earthing up potatoes, or as a seed  
" sowing and manure distributor." When used for hoeing,  
" the coulters are armed with moveable shares;" and when for earthing up "potatoes, the two binder tines are removed,  
" and a double share " "is attached to the slotted bar." The share, which "is made slightly concave, and fixed with the  
" convex side uppermost" is inserted in a slot formed in the sole of the tine.

[Printed, 14. 2d. Drawings. See *Mechanics' Magazine*, vol. 53, p. 41;  
*Patent Journal*, vol. 9, p. 173.]

A. D. 1850, January 17.—No. 12,930.

COWING, HENRY. — "Improvements in obtaining motive  
" power, and in steam and other ploughs, in land carriages,  
" in fire engines, in raising water for draining and other  
" agricultural purposes, and in apparatus for evaporating  
" saccharine and other liquors."

[No Specification enclosed.]

A. D. 1850, March 7.—No. 12,989.

FOWLER, JOHN, junior. — "Draining land."

1. A machine is described for forming drains in land and for introducing pipes into the drains. A carriage, mounted on five broad wheels or rollers, supports an upright coulter, which extends downwards into the earth, and carries at its lower end



a shoe or share (similar to a mole plough) whereby a small channel is formed at any desired distance below the surface. The drain pipes are strung like beads upon a rope fastened to the back of the share, and are thus drawn into the drain as the share advances. The machine is drawn across the field by means of a windlass worked by horses. Two ropes are connected at one end to the windlass barrel, and after passing partly round pulleys, the opposite ends of the ropes are brought back and fastened to the frame of the windlass. These two pulleys are united by a chain, which passes partly round a third pulley, connected to the draught chain of the carriage; and therefore as the ropes are wound upon the windlass barrel the carriage will be drawn forward. By means of a screw the depth at which the drain is cut can be adjusted, and when the plough is at work in level ground a slow motion is given to this screw from one of the running wheels so that the depth may be gradually increased and an inclination thus given to the drain.

2. Wooden pipes are used for draining land. Machinery for manufacturing the same is described.

3. As a substitute for drain pipes, leather is twisted into a rope and drawn into the trench formed by the share.

[Printed, &c. Drawings. See *Mechanics' Magazine*, vol. 53, p. 213, *Patent Journal*, vol. 9, p. 271.]

A.D. 1850, April 30.—No. 13,065.

MAY, CHARLES, and LEGGETT, ROBERT. — The invention relates, first, to improvements in thrashing machines.

Secondly, to "improvements in grinding machinery."

Thirdly, to "improvements in cutting straw and other similar substances."

Fourthly, to "improvements in applying steam power to machines used in farm buildings."

And, fifthly, to "improvements in machines for depositing seed," which consist in constructing machinery combining several sets of depositing apparatus, to which motion is communicated by rods, having bands or coils in them to obtain elasticity in their length, and which connect cams on an axle deriving motion through gear work from the running wheels, with cranks on an axis, which carries a certain instrument contained in each depositing apparatus, and made hollow for

the purpose of containing within it the upper part of a lever tongue, the lower part of which, owing to the movement of the instrument, serves to open and close alternately hollow jaws of the depositing apparatus; on the upper surface of the before-mentioned instrument are two holes, which measure the quantity of seed, and supply it alternately to each hollow jaw of the depositing apparatus; whilst hollow coulters, carried by the same frames that carry the depositing apparatus, which frames are connected to the machine by means of rods, make furrows in the land to receive the seed. By these arrangements, as the machine is drawn over the ground, "the seed is alternately measured and delivered, first on one side of the axis and then on the other, by the reciprocation of the instrument," and "the seed is alternately retained and set free by the tongue."

[Printed 2s 3d Drawings. See *Mechanics' Magazine*, vol. 55, p. 355; *Patent Journal*, vol. 10, p. 33.]

A.D. 1850, May 22.—No. 13,076.

COTGREAVE, ROBERT.—"Apparatus to be used in draining land."

1. An apparatus is described for cutting drains. It consists of a plough beam, having a triangular iron plate extending downward therefrom, and carrying at its lower edge a bar, which forms an inclined plane, terminating at the bottom in a cutter or share. The earth, as it is severed by the cutter, ascends the inclined plane and passing on to a mould board, attached to the inclined plane, is deposited thereby at the side of the trench. Two arms, pendant from the forward end of the beam, carry an adjustable block or guide piece, which travels on the soil in advance of the cutter, in order to regulate the depth of cut. This block may be furnished with circular knives to cut the sides of the portion of the earth intended to form the slice which is to be separated by the share. Spiked rollers may be employed to assist the passage of the earth up the inclined plane; or a series of rollers, supporting an endless belt, may be applied to the inclined plane. Two inclined planes and cutters may be affixed to the triangular plate, one above the other; or an inclined plane may be fixed to each side of the plate, so as to discharge the earth on both sides of trench. The machine may be drawn by

horses, &c. "In some cases it will be advantageous to employ  
"an apparatus similar to an ordinary capstan or windlass,  
"placed at a distance from the trenching machine, and con-  
"nected thereto by means of ropes or chains."

2. A machine is described intended to be used for filling  
in the earth which has been removed in the formation of the  
trenches. It consists of a triangular frame carrying tines and  
attached to a beam. The forward part of the beam projects  
down into the trench, and the scrapers as the apparatus is  
moved forward draw the earth from the sides into the trench.

3. An "implement for loosening the subsoil, so as to to  
"effect an improved drainage thereof" is described. It con-  
sists of a plough fitted with a block carrying circular cutters  
at its forward part. This block is adjustable by set screws,  
and has a parallel arm affixed to it which runs in the adjoining  
furrow and serves as a guide. Behind this is a mould board,  
and behind this a vertical cutter with a share at its foot for  
acting on the subsoil after the surface has been treated by the  
cutters and mould board.

(Printed, 10d. Drawing. See London Journal (Newton's), vol. 3<sup>d</sup> (conjoined  
series), p. 268. Mechanics' Magazine, vol. 53, p. 437. Patent Journal,  
vol. 10, p. 117.)

A.D. 1850, July 3.—No. 13,159.

HODGE, PAUL RAPHEY.—Steam engines, steam digger, &c."

The only part of this invention connected with the present  
series relates to a steam digger. In this a series of spades are  
worked by cranks on either one or two shafts above, and caused  
to penetrate the soil and again rise. Behind the spades is a  
transverse shaft with cam pieces thereon which strike against  
the spade when it is raised to its highest point and cause it to  
throw off the adhering soil.

[Printed, 2s. Drawings.]

A.D. 1850, July 3.—No. 13,165.

HORNSBY, RICHARD.—The invention relates, first, to "im-  
"provements in machinery for sowing seeds and depositing  
"manure." Motion is communicated to the seed barrel,  
through the medium of gear work, from the axle of the running  
wheels, and, the patentee remarks, and claims as part of the  
invention that, "the seed box in this machine is so arranged  
"as to move on an axis at or near the middle of its length, in

"order that the seed box may be capable of being made to  
"assume a horizontal position notwithstanding the irregu-  
"larities of the land." This is effected by the seed box  
having at one end a guide plate, with a slot therein, within  
which the neck or axis fixed to the box can turn and rise and  
fall; the other end of the seed box is supported on a spherical  
axis, and can be moved up and down by means of a shaft,  
turning in bearings, and having a crank handle at one end,  
and a left and right handed screw at the other which respectively  
work in screw nuts, connected to the framing of the machine  
by means of links, and to an arm affixed to the before-  
mentioned spherical axis by means of other links, so that  
"the nuts will be caused to come to or recede from each other  
"by turning the shaft" "in opposite directions."

Another improvement consists "of the making of the  
"coulters levers for seed-sowing machinery of malleable cast  
"iron."

Another improvement consists in a mode of steering the  
coulters, by means of an axis, having at one end arms or  
handles, whilst at the other end is fixed a half cog wheel,  
which takes into a toothed rack fixed on a connecting bar to  
the frame supporting the coulters bars.

Another improvement "has for its object better means  
"of steering the fore carriage of seed-sowing machines."  
Toothed bars, attached by pin joints to the fore carriage, take  
into pinions, which are moved by means of crank handles, and  
the stems of which are received into holes in a fixed bar;  
other mechanical contrivances may, however, in place of the  
racks and pinions, be employed for the purpose of moving  
the fore carriage at either end to or from the fixed bar.

"Another improvement in this class of machinery consists  
"in the use of flexible tubes in place of metal cups heretofore  
"used," for conducting the seed down to the coulters, which  
tubes may be made of any flexible material which will keep  
its tubular figure without the metal cups. The patentee  
finds it an improvement to apply forked instruments, in order  
to cover the manure with a quantity of earth before the seed  
is sowed over the same, in such manner that they shall, in  
their forward movement, present their convex surfaces to the  
earth. All these improvements are applicable to "apparatus  
"used for depositing liquid manure."

An improvement applicable "to ridge drills where rollers are used," "consists of making each roller of two parts, "with fitting pieces, so that the roller may be used as a narrow roller or as a wide one;" a second improvement "consists in combining with the use of suitable rollers for acting upon the ridges, rollers suitable for working in the furrows;" and a third improvement in ridge drills consists in combining therewith harrows, or instruments with tines or teeth, to work in the furrows.

Secondly, the invention relates to improvements in thrashing machinery.

Thirdly, to "improvements in machinery for dressing or winnowing corn."

And, fourthly, to "improvements in portable steam engines and boilers for agricultural purposes."

[Printed, &c. &c. Drawings. See *Mechanics' Magazine*, vol. 54, p. 38; *Patent Journal*, v. n. 10, p. 200.]

A.D. 1850, July 4.—No. 13,168.

**TUXFORD, Weston.**—The invention consists, first, of "improvements in machinery for crushing or pressing land." Two end framings are bolted to the frame of this machine and have axes "cast on them extending beyond the roll for receiving the travelling wheels when it has to be removed from place to place, and prepared, one with a parabolic pin, and the other with a conical socket, forming a part of "a "flexible axis," which is formed by a series of rings, in order to press the land, each ring "being provided with a "parabolic pin and conical socket," which fit each into each other. Intermediate guides bolted to the framing receive forks which slide up and down the guides, "allowing the free rise and fall of the flexible axis, and checking its lateral motion," which forks also carry the weight of the roller, when being moved from place to place, and, by means of rods and levers with balance weights, distribute the weight of the frame along the roller.

Secondly, of "improvements in machinery for shaking straw.

And, thirdly, of "improvements in applying steam power "to agricultural machinery."

[Printed, &c. &c. Drawings. See *Mechanics' Magazine*, vol. 54, p. 38. *Engineers and Architects' Journal*, vol. 14, p. 84; *Patent Journal*, vol. 10, p. 214.]

A. D. 1850, August 12.—No. 13,222.

THOMPSON, GEORGE. — The invention consists, first, in  
" the mode or modes of arranging spades or other instruments  
" suitable to the earths or substances they are to be employed  
" in cutting or digging, in connection with a crank or other  
" mechanical contrivance, so that the top part of the stock  
" of the spade or other instrument moves in connection  
" therewith in a circle, or more properly speaking, has a recti-  
" linear motion, and the blade or lower portion of such spade  
" or instrument a curvilinear motion." The spades or other  
instruments are described as "so arranged and fitted to the  
" cranks, the throws of which are alternate or at right angles  
" to each other, that only a portion of the same on each crank  
" are in action or come into contact with the earth at the same  
" time," and "by the arrangement of the throws of the cranks  
" and the spades the undug spaces left between the spades  
" of the front crank are dug by the spades on the hinder  
" crank." The cranks derive motion, through connecting  
gear, from one of the running wheels of the machine, and  
can be thrown in and out of gear by means of a clutch  
arrangement on each of the spindles of the toothed wheels,  
which drive pinions on the cranks. Upon each end of a cross  
spindle, fitted in the stock of each spade so as to work freely  
therein, are fitted guide wheels, which work in guide frames,  
and cause the spades to be kept steady and the requisite  
motion to be attained. It may be desirable to dig or cut the  
earth by one row of spades or cutters arranged on one crank  
shaft, in which case, the spades are made wider, and, as the  
guide frames must consequently be made shorter, a guide  
piece,—the ends of which are fitted into the eyes of guide  
rods, which work in guide bushes bolted to the frame—is  
connected to each end of the cross spindle. A jointed spade  
with a stock joint, and spring at back to keep it firm, is  
represented in the drawings. "This arrangement," the  
inventor says, "may be found useful for digging some sorts  
" of earth."

Secondly, in "the mode of arranging boxes or receptacles  
for receiving the earth or substance from the spade or other  
" instrument used in the machine, so that they shall be in or  
" take a position to receive the earth at the time the same



" is about to leave or fall from the spade, and turn over and  
 " discharge their contents simultaneously with the retiring  
 " motion of the spade or other instrument." The boxes are  
 connected with eccentrics, which are brought into action,  
 thereby causing the boxes to be overturned, by means of a  
 crank shaft; or, in place of a crank, the eccentric rods may  
 be worked by a combination of levers. The boxes may work  
 in the same direction as the spades, and thereby turn the earth  
 from where it had been dug, or, they may act in a contrary  
 direction, and throw the earth over to the left or right, as  
 may be arranged, for leaving an open trench or forming a  
 ridge.

Thirdly, in the mode or modes of arrangement of the  
 mechanical parts of the invention, "so that the object is  
 " effected of cutting or digging (separately or in conjunction)  
 " the earth, and turning the same over simultaneously, or as  
 " may be required, with the action of the spade or other  
 " instrument to be used in the machine, and in the application  
 " and arrangement of various mechanical appliances, as  
 " described, for the purpose or purposes herein specified."

(Printed, 1s. Drawings. See *Mechanics' Magazine*, vol. 34, p. 137, and  
*Patent Journal*, vol. 19, p. 238.)

A.D. 1850, October 17.—No. 13,284.

MICHIELS, GEORGE. — "Improvements in treating and  
 " and preparing potatoes for seed." In reference to the first  
 part of the invention, the patentee says, "I claim as new, in  
 " the treatment of potatoes for seed, the extraction of the  
 " germs or eyes, surrounded by a uniform and very small  
 " quantity of potato flesh, by means of an instrument,"  
 " shaped or regulated to pass into the potato to the base of  
 " the germs or eyes, and no farther, and to extract the same  
 " germs whole and perfect, and uninjured in every case, with  
 " the minimum of potato flesh surrounding them. And I  
 " also claim as new the said instrument for treatment of  
 " the potato," "especially in its distinguishing formation of  
 " an exterior rim," "which should not exceed two-tenths of an  
 " inch in width, and which serves the important purpose to  
 " the manipulator of unerringly arresting the progress of the  
 " instrument into the potato instantly that it has reached the  
 " proper depth, viz., the base of the germ." The handle of

the instrument "is shaped as an inverted hollow cone, for  
" the purpose of allowing the extracted germs to fall out  
" easily from the pipe downwards through the handle."

The second part of the invention consists "in the application  
" of charcoal to the germs or eyes when extracted, by which  
" they are so prepared that they will keep fresh and sound  
" for several months." The charcoal, which the patentee  
recommends to be made from the wood of the poplar tree,  
must be ground to a fine impalpable powder. "The germs, as  
" extracted, should be placed in a barrel or box, and sprinkled  
" with the powder, or shaken about in a barrel or box con-  
" taining powder, until each germ gets a coating upon it."  
" When the box or barrel is filled to the extent desired, a  
" layer of powder should be spread at the top, and the lid  
" or cover be put on, and in this state the germs can be  
" stored out of the influence of the frost until the season  
" arrives for planting."

[Printed, &c. Drawing. *See Mechanics' Magazine*, vol. 54, p. 336; *Patent Journal*, vol. 11, p. 131.]

A.D. 1850, October 17.—No. 13,285.

**FOWLER, JOHN, junior.**—"Machinery for draining land and  
" for cutting and boring wood for drain pipes."

The inventor proposes to drain land by drawing the drain  
pipes through the subsoil by means of a plough. This plough  
is fitted with a coulter passing down vertically into the earth  
and having a foot resembling a share in shape. The coulter  
is capable of being raised or depressed by a rack and gear.  
To the foot or shoe of the coulter is attached by suitable means  
a rope which passes through the series of pipes or tubes in-  
tended to be drawn into the channel formed by the plough,  
and at the other end of the rope is a similar contrivance for  
the attachment of yet another string of pipes. Square or  
angular pipes may be used as well as cylindrical pipes.

A share of suitable form being used the draught bar of the  
carrriage is attached to a frame that travels in front of the  
plough upon a small roller, and carries a pulley around which  
a wire rope passes, connecting the plough to a windlass; or,  
when the plough is required to go faster, the pulley is dispensed  
with, and the rope from the windlass is connected to the  
draught bar. The windlass barrel is keyed to an upright

axis, which turns in bearings in a bed-plate and in an arched support affixed to this plate. To the back edge of the bed-plate is jointed a plate, forming an anchor, which is let into the ground when the apparatus is in use, and serves, in conjunction with a stay bar and retaining chains, to hold the windlass in its proper position.

[Printed, 4s. 10d. Drawing. See *Mechanics' Magazine*, vol. 64, p. 337.]

A.D. 1850, November 23.—No. 13,362.

**BENDALL, JAMES.**—"Improvements in certain agricultural implements."

The invention consists, first, in "the adaptation to scariers, skin ploughs, or other like machines or implements employed in the tilling and cultivation of land" of improved means "for raising or depressing the frame carrying the shares or points." Upon a shaft, the ends of which are both cranked in the same direction, and carry upon them the running wheels, is fixed a segment, perforated near its periphery with a series of holes. Close to the face of this segment, and placed loosely upon the same axle shaft, is a lever, connected at its upper end, by a bar or rod, with a lever handle, and having an eye or hole through it corresponding to the series of holes in the segment; so that, by means of a bolt or pin, the relative positions of the lever and segment may be fixed, according to the distance the points or shares upon the frame are required to penetrate into the land. A modification of the above arrangement is described, wherein "the axle shaft" "is made of two parts, and has separate bearings, and movement can be given to either of them, so as to elevate or depress either side of the implement at pleasure. There are also two distinct sets of elevating levers and apparatus one upon each side, acting independent of each other."

Secondly, in an "improved head piece to which the front or leading wheel of such above described machines or implements is attached." A vertical bar, by which the front wheel is carried, passes through a bush in the end of the beam, or bar attached to the framing, and can be adjusted by means of a pin so as to regulate its height from the ground.

Thirdly, in an "improved mode of fitting and mounting the wheels upon their axles of such above described machines

“ or implements, by means of bushes and shields of white or case-hardened iron.”

Fourthly, in “the making or forming the shares, or points, or other parts of ploughs, scarifiers, and other like machines or implements employed for the tilling and cultivation of land (which penetrate into the land) in separate and movable points or tips.”

Fifthly, in an “improved arrangement and construction of mill,” for grinding or crushing all descriptions of grain.

Sixthly, in an “improved construction of machine or mill for cutting and slicing turnips and other like roots.”

Seventhly, in an “improved mode of making the shares, points, and other parts of agricultural implements which penetrate the soil, by the employment of” “a compound of steel and cast-iron;” the shares, and other articles being cast in cast-iron moulds for chilling them in the ordinary manner.”

[Printed, 1s. Drawings. See *Mechanics' Magazine*, vol. 64, p. 458, and *Patent Journal*, vol. 11, p. 124.]

A.D. 1850, November 30.—No. 13,366.

**BLAKEMORE, RICHARD.**—“Improvements in the construction of ploughs.”

The patentee says, “hitherto the coulter or cutter which makes the vertical cut into the earth has been fixed to the beam or framework of the plough, and descends therefrom into the earth, such arrangement offering considerable friction and causes obstruction to, and the same become quickly clogged with roots, stubble, grass, weeds, and other rubbish. Now, according to my invention, I employ flat cutters or blades to the lower parts of ploughs, so that the cutting is from below upwards, and the form of the blade or cutter tends to throw off the roots, stubble, grass, and other rubbish, and thus is much friction avoided, and the clogging of the blade prevented, or nearly so.” The cutter, which may be fixed to the land side of any plough, “is a blade of plate iron or steel, which is sharp at the forward edge, and the point thereof precedes the point of the plough share.”

[Printed, 6d. Drawing. See *Repertory of Arts*, vol. 18 (enlarged series), p. 53. *Land-Journal* (Newton's), vol. 31 (enlarged series), p. 127. *Mechanics' Magazine*, vol. 64, p. 457; *Patent Journal*, vol. 11, p. 113.]

A.D. 1850, December 7.—No. 13,398.

BROOMAN, RICHARD ARCHIBALD.—(*A communication.*)—  
"Agricultural machines."

A reaping machine is described. The cutter consists of a straight or indented serrated blade, reciprocated by a crank driven from the principal bearing wheel. The fingers are of a "spear-head shape," and are supported each by a separate stem from a bar below; they are not connected to the bar at their hinder ends, which appear to be more or less bluntly pointed, the edges against which the cutter acts being thus inclined in the opposite direction to the edges entering the corn.

The teeth of the cutter are by preference "divided into sections corresponding to the number of fingers, each section having one half of the teeth inclined in one direction, and the other half having the teeth inclined in the opposite direction."

Over the cutters is a reel or gatherer, mounted so as to be adjustable in height, and revolved by a belt. There are guide boards at the sides of the cutter, and a platform behind on which the cut grain falls and whence it is raked off. The machine is drawn by horses in front of the main bearing wheel. There is a seat for the driver, and one with a front support for the raker. A canvas screen is fitted at the back of the platform.

(*Printed, &c. Drawing. See Repertory of Arts, vol. 13 (enlarged series), p. 131; Mechanics' Magazine, vol. 56, p. 118; Patent Journal, vol. 11, p. 216.*)

A.D. 1851, March 24.—No. 13,564.

GUTHRIE, GEORGE.—"Machinery or digging, tilling, or working land."

This invention consists in a machine for digging land by steam or other suitable motive power. A steam carriage is described, mounted on four wheels with broad rims or tires, to enable it to pass easily over the land. At the back of the machine are several "grapes," forks, or spades which are successively caused by the steam-engine, through the intervention of cranks and gearing, to enter the earth; then, by a motion approximating to that of the ordinary spade in digging by hand, to raise a portion of the soil, and on arriving at a horizontal position, or nearly so, to make a semi-revolution

and throw off the earth. This is effected by two cranks one above and one below a point on the handle of the fork where it is pivotted to a fixed point. The upper crank forces down the fork, and when the fork is sufficiently deep in the ground the second crank forces the fork handle back, the pressure of the first crank down still continuing so that the fork is raised to a horizontal position. The connecting link from the lower crank is attached to a slide on the handle which slides over a short screw on the handle and thereby rotates the handle. During this movement the machine is advancing at a slow rate, so that when each fork, &c. again descends, it will act on fresh ground. To cut through the surface of the earth in parallel lines between the forks, a shaft, carrying a series of cutting discs, is applied to the machine in a horizontal position, near the ground, and just in front of the line of forks. Instead of the lower crank, a second crank may be arranged over the forks. It may also be caused to work the turning action of the forks "by a bell crank or pulley action" or otherwise. Also, instead of the second lower crank, pulleys on the upper crank shaft may be arranged to effect the required movement. It is likewise stated that "the necessary digging action may be effected by grapes fast on a continuously revolving shaft having fixed or adjustable scrapers, so planned as to remove the earth carried up by each grape in its revolution, the object in all cases being to produce a mechanical digging action, assimilated as closely as possible to the principle of manual digging."

[Printed, 10d. Drawing. See *Mechanics' Magazine*, vol. 55, p. 279; *Practical Mechanics' Journal*, vol. 4, p. 256; *Patent Journal*, vol. 12, p. 15.]

A.D. 1851, April 15.—No. 18,594.

HARDY, CHARLES.—(*A communication.*)—"Manufacture of scythes."

The amount of steel required to form the scythe is decided by causing a portion of the bar of steel to displace as much water as a bar of known volume. The bar is then drawn out under a 2 cwt. hammer, to the length required and to a breadth equal that of the back of the completed scythe. Next the handle is formed and the blade curved. Next the point is formed by hand and the end of the handle turned up. Next the edge is formed under a 3 cwt. hammer. Then the rib is "set off." Next the scythe is "planished cold," under



a 14 cwt. hammer. After this "the edge of the scythe is cut out by the beam cutting machine or by the hand shear." Then it is hardened by heating in a furnace of a special sort (described), in which "the scythes are heated without access of atmospheric air taking place," and tempering in a bath of "beef, suet, and mutton fat mixed with about an equal portion of resin deprived of water;" after the bath it is "dried in powdered charcoal" and "beaten in water after having been slightly heated, or better still, it is washed in boiling water, which removes every particle of grease, and then it should be slightly heated and beaten in cold water." Next it is reheated and annealed in sand." There are certain variations in the amount of heat employed, according to the quality of the scythe required. It is finished with a "small polished hand hammer, and an anvil similarly polished." The final edge may be given by the stone on the hammer. For sharpening the scythe in use, the mower may employ a "small hand hammer with a cross end and a small portable anvil composed of a vertical stock, from nine to ten inches long with a head like a hammer, of about one inch square and finished in the middle with a cross piece of an 8 shape or other analogous form." The anvil is fixed in the ground, the stock entering as far as the cross piece. The edge is finished with the hand-stone.

[*Fig. 1, 2d. Drawing.* See *Mechanics Magazine*, vol. 55, p. 338. *Artisan*, vol. 10, p. 7. *Pat. & Journal*, vol. 12, p. 111.]

A.D. 1851, June 12.—No. 13,661.

**D'URCLE, FELIX CHARLES VICTOR LEON LE VACHER.**—This invention "consists in developing the natural biennial properties of autumn wheat, by an improved process of sowing and treating the ground." The ground having been well manured beforehand, picked grains of wheat are to be sown, late in the spring, so that the "biennial properties" of the plant may become developed, by its not being allowed to blossom the same year, in rows, from nine and a half to twenty-three inches apart; four or five grains being set in the form of a circle or of a square, and each set placed at a distance from each other in the row of two and a half inches. It is preferred that the sowing should take place at a period between the twentieth of April and the tenth of May following, the patentee having found this to be the most suitable moment. "When

“ the wheat has attained the height of four or five inches, one  
 “ plant alone is allowed to grow at the planted places, and  
 “ the produce of all the other grains, that is to say, all the  
 “ other plants, are pulled out.” “ When the dressing is  
 “ accomplished as herein-before stated, the field may be left  
 “ uninterrupted until the harvest of the following year.”

(Printed & Drawing See 15 to 19 Journal, Newton's, & 140 to 144 of  
 process, 199, Mechanica Magazine, vol. 33, p. 486. Printed Manchester,  
 January, 1835, p. 2.)

A.D. 1831, July 3.—No. 13,678.

**HOWARD, JAMES.**—“ Ploughs and other implements or machines used in the cultivation of the soil.”

This invention consists, first, in a means of “ connecting  
 “ the share to the plough, and adjusting it to the required  
 “ position for entering the soil.” “ The lever neck enters a  
 “ socket formed in the share, and” “ a screw hook or share  
 “ rod is employed for holding the share upon the lever; but  
 “ the construction of the lever itself is somewhat peculiar.”  
 “ Instead of connecting the lever to the plough frame”  
 “ by passing a loose pin through corresponding holes in the  
 “ lever and the frame, a fulcrum pin” “ is permanently fixed  
 “ in the lever neck,” “ and this pin is made to rest in bearings  
 “ at the forward end of the frame.” At its hinder end the  
 lever “ carries a clamp” “ with a ribbed face, which is made  
 “ to bear against corresponding ribs on the hind end of the  
 “ frame,” “ by means of a binding nut” “ working on the  
 “ hind extremity of the lever, which is tapped with a screw  
 “ thread for that purpose.” The patentee says, “ instead of  
 “ making the shares and levers separate, I sometimes weld  
 “ them together, or form them in one piece,” “ and thereby  
 “ increase the strength, and obviate the necessity for the  
 “ share rod, as well as save the expense of forming a socket  
 “ to the share.”

Secondly, “ in making plough coulters out of oval or oblong  
 “ instead of round bars, by which means greater strength with  
 “ less weight of metal is obtained,” “ suitably shaped lugs”  
 “ being provided, “ for holding the coulters to the plough  
 “ beam.”

Thirdly, in improvements in subsoil ploughs. The first  
 improvement under this head consists in employing two beams,

" which are connected together by bolts or rods," " and thereby  
 " form one rigid frame." " The advantage of the double  
 " beam is, that it offers great facility for fixing the coulters  
 " and wheels." " The second improvement in the subsoil  
 " plough consists in providing two wheels for running in the  
 " same track on the land or unploughed ground, while one  
 " wheel " runs in the furrow."

Fourthly, " in a new construction of cast-iron wheel for  
 " ploughs and other agricultural implements." " The novelty  
 " consists in casting the wheel with a hollow conical boss,  
 " having a stopped forward end, and a flange or lip at its  
 " hinder end to receive a cap in the manner of what are  
 " known as patent axle boxes."

Lastly, in " means of temporarily converting jointed harrows  
 " into rigid or fixed harrows." From the jointed bar of a  
 harrow two pins project, and these are connected together by  
 means of a chain and tightening screw. " When, therefore,  
 " the implement is to be used as a jointed harrow the chain  
 " is left slack, but when it is required to be made rigid the  
 " chain is tightened up, and the shoulders of the hinge are  
 " brought into contact." The inventor does not confine  
 himself to this mode, as " many other plans more or less  
 " efficient might be adopted for obtaining the same end."

[Printed, 10d. Drawing. See London Journal (*Newton's*), vol. 40 (*continued series*), p. 169, *Mechanics Magazine*, vol. 66, p. 38.]

A.D. 1851, . . . . .—No. 13,678\*.

HOWARD, JAMES.—In a Disclaimer and Memorandum of  
 Alteration filed April 8, 1858, the patentee states that he  
 desires to amend the title of his Specification by omitting the  
 words " and other implements or machines used in the culti-  
 " vation of the soil;" also that he desires to amend the  
 Specification itself, by " striking out " " and disclaiming all  
 " such description, figures and references as relate to the  
 " second, third, fourth, and fifth heads of " the " invention,  
 " retaining only such description, figures and references as  
 " relate to the means of connecting the share to the plough  
 " and adjusting it to the required position for entering the  
 " soil." A slight verbal alteration is also made in the wording  
 of one part of the Specification.

[Printed, 4d. No Drawings.]

A.D. 1851, September 25.—No. 13,757.

**BROWN, DAVID STEPHENS.**—"Agricultural implement."

The patentee says "the nature of my invention consists in  
" the adaptation of revolving cutters or blades to till the soil ;  
" and the manner in which my said invention is to be performed  
" is as follows :—Upon a framework I mount spindles, to the  
" lower ends of which cutters or blades are fitted ; and I  
" communicate rotary motion to them by means of wheel  
" gearing from any prime mover. The rotary motion of the  
" cutters, and the manner in which they are disposed, cause  
" them to enter, break up, and pulverize the soil." The  
machine represented consists of a frame or platform, which  
travels on three wheels, and carries two rows of spindles,—  
one row extending across the frame near the middle of its  
length, and the other row across the hinder part. The spindles  
of each row incline downward through the frame, so that their  
lower ends, which carry the cutters, will enter the earth, and  
the two sets are so arranged with respect to each other, that  
each cutter of the back set will work in a line drawn from the  
centre of the space between two cutters of the front set. The  
upper ends of the spindle are fitted with bevel wheels gearing  
into corresponding wheels on two horizontal shafts, which are  
put in motion by a steam engine (mounted upon the framework  
of the implement, or on a separate truck) or other motive  
agent ; and thus the cutters are caused to rotate and break up  
the soil. The bearings of the spindles are jointed to the  
framework, so as to admit of any particular spindle or of all  
the spindles and cutters being raised out of the ground. The  
size and shape of the cutters may be varied according to the  
nature of the soil. The machine is "propelled over the ground  
" by horse or steam power."

[Printed, sd. Drawing. See *Mechanics' Magazine*, vol. 50, pp. 277 and 301.]

A.D. 1851, September 25.—No. 13,758.

**KAEMMERER, ERNST.**—The invention relates to a machine,  
its several working parts, and modified modes of action for  
sowing by broadcast, by dibbling, and by drilling. The  
inventor claims,—

First, a machine for sowing broad-cast. The corn or seed  
flows from seed chambers through apertures into seed-distributing  
chambers, whence, by the revolution of wheels, the

axle of which derives its motion from the running wheels, and on which are fixed distributing buckets, it is discharged, through funnels connected with holes in the bottom of the machine, on to a board, and is thence distributed over the ground.

Second, a machine for sowing in drills. In this case, the distributing-board is removed, and a frame, having conducting tubes to coincide with the holes in the bottom of the machine, is attached in lieu thereof, the lower ends of these tubes serving to deposit the seed in rows.

Third, a machine for dibbling or sowing at intervals. In this case, "a set of change wheels are provided" "for each machine, by means of which the relative speeds of the machine wheels" "with its cog wheel" "and the bucket shaft wheel" "can be changed, thus causing the buckets to discharge more or less their contents over a given distance as may be required."

Fourth, a mode of arranging all the surfaces of the seed-receiving chambers with surfaces either vertical, or so inclined as to cause the contained seed to flow to the apertures leading to the seed-distributing chambers; these apertures being also provided with slides to shut off the supply of seed. The object of this arrangement is, "that the quantity of seed flow on" "to the seed-distributing chambers shall have a due proportion to the quantity taken up by the buckets and delivered into the funnel."

Fifth, the peculiar form of the seed-buckets, of which there are three kinds, as represented in the drawings, and which are made of brass, or other suitable metal, and fixed to annular rings of brass. The inventor prefers, however, to make the seed-buckets "of brass, cast on with annular rings."

Sixth, "the construction and arrangement of the bucket wheels and rings," the rings being secured to each wheel by means of clamps, whereby the sets of buckets may be removed and changed as required.

Seventh, "the construction of the seed-conducting tubes," which are varied in arrangement and form, and have gutta percha tubes fixed to their ends to conduct the seed to the drills. "For better ground the conducting tubes are made with a joint, by means of which their vertical position may be always maintained."

Eighth, "the peculiar arrangement of the seed-distributing

"board," which is hung by hinges to the bottom of the seed chest. To the upper part of this board are fixed triangular dividing blocks, one of which is placed under each funnel, for the purpose of dividing the seed; whilst under these blocks are placed rows of pegs, made of cane or other suitable material, for the purpose of distributing the seed evenly over the ground. The inventor remarks "I do not claim the use of the distributing board when made with dividing blocks only, but only when pegs are used with them."

Ninth, the use of slides, "by means of which the seed-distributing chambers may be emptied in an expeditious and easy manner."

[Printed, 1s. 6d. Drawings. See *Mechanics' Magazine*, vol. 36, p. 270. *Practical Mechanic's Journal*, vol. 4, p. 210, and vol. 5, p. 56.]

A.D. 1851, October 16.—No. 13,773.

**ONIONS, WILLIAM.**—"Improvements in the manufacture of nuts and bolts; also of steps, bearings, axles and brushes; also of mills and dies for engravers; also of bells, lathe and other spindles; also of web forks, shuttle tongues and lips for looms; also parts of agricultural implements, chains, roller guides and throstle bars, by the application of materials not hitherto used for such purposes."

The above is the full title. Parts of it, including that referring to "agricultural implements," are disclaimed, and no further reference thereto appears in the Specification.

[Printed, 4d. No Drawings. See *Repository of Arts*, vol. 16 (*continued series*) p. 374, and 377 for *Letters Pat.*, &c., &c. p. 12, and p. 123 for *the same*. *Mechanics' Magazine*, vol. 40, p. 376. *Engineers' and Architects' Journal*, vol. 16 p. 143.]

A.D. 1851, . . . . .—No. 13,773."

**VALLANCE, HENRY**, Assignee of **ONIONS, WILLIAM**, in the matter of Patent No. 13,773 granted to the latter as above.

A disclaimer was entered April 14, A.D. 1852, disclaiming certain parts of the title, including, among others, the words "parts of agricultural implements, chains, roller guides and throstle bars."

[Printed, 4d. No Drawings.]

A.D. 1851, October 16.—No. 13,776.

**GIBSON, MATTHEW.**—"Improvements in machinery for pulverizing and preparing land." The invention "consists of



" using series of discs on separate axes in such manner that  
 " the several discs shall be independent of each other, and  
 " that the discs of the different series may work between each  
 " other, and also that the axes carrying the different series of  
 " discs may rise and fall by being affixed to or having bearings  
 " in a lever at each end of the machine."

[Printed, *Ed. Drawing.* See *Repertory of Arts*, vol. 19 (*enlarged series*),  
 p. 278, *Mechanics' Magazine*, vol. 34, p. 337.]

A.D. 1851, October 23.—No. 18,786.

PAPE, JOHN HENRY.—"Improvements in ploughs," wherein the principal feature of novelty consists in the employment of a hollow cylinder or wheel, bearing in its centre an axletree, to which are adapted the different parts of the plough; which plough is capable of being regulated and fixed to the depth to which it shall enter the ground, a mechanical contrivance being also described whereby the ploughman can, by means of handles, regulate the depth without stopping the plough. Attached to the frame of the plough is a seed-box, within which a brush, which derives motion from the cylinder, serves to brush the seed through holes, whence it passes through tubes to the ground; the quantity of seed so passing through the holes being regulated by an iron plate which covers the bottom of the seed-box. The hollow cylinder, which has openings therein that "take up a portion of earth at the bottom and throw it above after a half turn round," serves to cover the seed. A harrow combined with a roller is attached to the hind part of the machine.

Another machine is described, wherein the cylinder "which until now has been used only as a wheel and to bring up fresh earth to cover the seed, is here employed instead to heat the ground by steam;" its hollow part being formed as a boiler, whilst the hollow axletree, whereon is fixed the grate to receive the fuel, receives also in its interior a tube, through which the steam and smoke pass out.

Another apparatus is described, whereby motive power is given to the implement "calculated to add to that of the horse." In this case the hollow axletree receives in its interior a valve, which derives motion by means of angle wheels moved by points fixed on the cylinder, and in which are bored four holes to distribute the steam upon a piston rod; "the piston in coming out of the cylinder meets the ground as points of

" resistance, and by that means pushes on the plough by its  
" center, this piston is brought up again by a spring." A  
modification of this apparatus is described, wherein gunpowder  
or gun-cotton may be used in place of steam.

[Printed, 10*l*. Drawings. See *Mechanics' Magazine*, vol. 56, p. 358.]

A. D. 1851, December 1.—No. 13,836.

**EXALL, WILLIAM.**—Agricultural implements. Among the  
implements described is a reaping machine. The cutters are  
fitted on an endless chain running over pulleys on vertical axes.  
They work through fingers in the usual manner. The crop is  
received on an endless cloth running backwards from the  
cutters, and this delivers to a second similar cloth behind run-  
ning across and delivering at the side. In place of this  
arrangement a "collector" may be used; this consists of a  
rake mounted in a frame on wheels, and with a lever handle  
above by which the tines can be lifted. This is attached to  
the back of the reaper, or it may be used separately, shafts for  
traction being added.

[Printed, 1*s*. Drawing. See *Mechanics' Magazine*, vol. 56, p. 476.]

A. D. 1852, January 24.—No. 13,910.

**STACEY, GEORGE.**—"Machinery for reaping, mowing, and  
" delivering dry or green crops."

A set of double edge cutting blades, pivotted on a horizontal  
bar, have a vibratory motion given them by a second bar,  
parallel with the first, to which their hinder ends are pivotted.  
Intermediate of the vibrating cutters is a series of fixed cutters  
rigidly attached to the fixed bar. The moving bar has a to-  
and-fro movement given it by a crank driven from one of the  
running wheels. The frame in which the apparatus is mounted  
is carried on two wheels, one large one as above, the other much  
smaller. Instead of the smaller one a sledge runner may be  
used. Behind the cutters is an endless web, running from side  
to side of the machine. By this the cut crop is carried to the  
side of the machine, where it is retained on the web by a pair  
of suspended arms. A catch actuated from the running wheel  
occasionally raises these arms, and allows the heap of corn, &c.  
to fall out at the side. The machine is drawn by a horse,  
harnessed in front at one side, so as not to come before the

cutters, which do not occupy the whole space across the machine.

[Printed, 16d. Drawings. See *Mechanics' Magazine*, vol. 57, p. 115.]

A. D. 1852, January 27.—No. 13,924.

DRAY, WILLIAM.—(*A communication from Obed Hussey.*)  
—Reaping machines.

The machine is supported on one large bearing wheel, in front of which is the attachment for the horses, and a small wheel next the crop. The cutters are lancet shaped and are carried by a vibrating bar driven by a crank from the bearing wheel. They act between guard pieces above and below. Behind the cutters is a small platform which receives the cut crop, and whence it is pushed by a hand rake either on to the ground or on to a second platform behind. Instead of being thus delivered by hand, one of several appliances may be used to deposit the crop on the ground. (1.) A swinging "crane" with an arm may receive the crop thereon so that it can be swung to the side when the arm is full. (2.) A tilting platform actuated by a lever handle may be thus used. (3.) A revolving reel may work over the cutters to carry the crop back on to the platform.

[Printed, 6d. Drawings. See *Repository of Arts*, vol. 20 (*enlarged edition*), p. 152; *Mechanics' Magazine*, vol. 57, p. 117.]

A. D. 1852, January 31.—No. 13,943.

ROBERTS, MARTIN JOHN.—The invention consists, first, of a machine for digging and tilling land. In this machine, a series of tines or spades are fixed on shafts or rocking bars, the ends of which pass through, and revolve freely in, holes around the circumference of two parallel cast-iron discs, which revolve freely upon a cranked axle fixed to the framework. The shafts, with their tines attached, have a rocking motion backwards and forwards, in consequence of their being connected by rods to the cranked axle, so that "the centre of these rocking bars turns eccentrically to the centre of the pin of the cranked axle." The desired motion of the tines may be obtained, in place of cranking the axle, by other mechanical arrangements.

Secondly, in "the arrangement of circles, or parts of circles, "eccentric to the course or path of the tines in digging "machines, for the purpose of cleaning them."

Thirdly, "in an improved arrangement of machinery for rolling land when in ridges." Three or more rollers are jointed together in such a manner that they can adjust themselves to the form of the ridge; such rollers revolving freely on their axes, which have rods and weights, or else springs, attached, in order to effect the pressing of the land.

Fourthly, in an apparatus for feeding calves, lambs, and other animals.

Fifthly, in an improved milk can.

Sixthly, in an improved chaff-cutter.

Seventhly, in an improved harrow, wherein the tines are carried by a series of levers of unequal lengths, having weights attached, one to each lever. "These levers have formed in one of their ends a hollow boss through which the axle of the driving wheels is passed."

Eighthly, in an improved cheese press.

Ninthly, in "the application and adaptation of centrifugal machinery to the separation of whey from curd in the manufacture of cheese, and the separation of butter-milk from cream in the manufacture of butter."

[Printed by Drawing. See *Mechanics' Magazine*, vol. 57, p. 122.]

A.D. 1852, February 9.—No. 13,962.

RIDLEY, RALPH EBBINGTON.—"Cutting and reaping machines."

The machine described consists of a frame supported on bearing wheels, and having a pole behind with bars to which the horses are harnessed, and also of a second frame attached in front of the other, and carrying the cutters and the gathering apparatus. Motion is communicated from the bearing wheels to a crank shaft whence the different parts of the machine are driven. The cutters are arranged to have a shearing action. There is a fixed set, carried by a bar which extends across the front of the machine, and against these a moving set acts. These are pivotted, each one to one of the fixed set, while their hinder ends are pivotted to a reciprocating bar, parallel to the fixed bar, to which motion is given by levers from the crank shaft before mentioned. The moving cutters are slightly curved down at the points towards the fixed cutters, and to ensure contact at the edges during the whole of the cut each cutter is kept up to its work by a small spring. The cut crop

is received by two endless bands, working from the sides towards the centre of the machine, and these either deliver on to the ground, or on to a pair of boards which are withdrawn at intervals by the action of a cam, and allow the corn, &c. to fall in a heap on the ground. A rotating gatherer may be fitted over the cutters. The front framework is carried on four small running wheels; the axles of these rest in slotted bearings and by means of guide rods, the wheels may be turned to one side or the other, to guide the apparatus. The object of having four wheels, two on each side, is to cause the machine to remain level when traversing ridge and furrow. The front portion of the apparatus can be raised by means of a chain attached to its foremost end and wound on a whelp wheel. When the cutters are not required to be in action, they are thrown out of gear with the wheels.

(Printed, 1s. Drawing See *Mechanics' Magazine*, vol. 57, p. 141.)

A.D. 1852, March 25.—No. 14,043.

BENTALL, EDWARD HAMMOND. — "Improvements in the construction of ploughs." The invention consists, first, in an improved mode of "constructing the beams of ploughs of bars of iron," either straight or curved, "furnished with projecting flanges or ribs at the sides for the purpose of strengthening the same." These bars, when bolted together, form a kind of hollow framework, within which the coulter may be fixed.

Secondly, in a mode of "constructing double or turn-wrest ploughs, or any mere modification thereof, in which the frame or frames which carry the ploughs is or are firmly fixed, by bolts, rivets, or otherwise, direct to the beam, which, therefore, must be turned over or upside down when the uppermost plough is required to be brought into operation." In this plough, the handles move on a fulcrum pin, whereby they are attached to the hinder end of the beam, being held in an elevated position by means of a pin, inserted through one of two holes at or near the extremities of a segmental T piece, and through an eye on the plough-beam. "On the plough arriving at the end of the field it is turned on to its side, and the pin which holds the handles in their elevated position is withdrawn, and the handles are

“depressed. The horses will then, in turning round, cause the plough to roll over, and the share, breast, and coulter, which were before in an elevated position,” “will be made to take up a working position. The handles are now raised to their former elevation, and they are secured by the pin being inserted into the eye at the opposite side of the T-piece.”

Thirdly, in “the use of a rectangular slot and wedge for attaching the shares of ploughs to the spit.”

*[Printed, 8d. Drawing. See London Journal (Newton's), vol. 41, (conjoined series), p. 423, Mechanics' Magazine, vol. 57, p. 316.]*

A.D. 1852, April 17.—No. 14,069.

GILLET, JOHN.—This invention consists, first, in the application to turnfurrow ploughs of “a forward share, which, being set at the ridge side of the plough in the line of the track of the horses, or at a little distance to the right of the ordinary ploughshare, and adjusted so as to cut the earth at a line a little below the imprint of the horses' hoofs, will lighten the subsoil, and leave it in a fit state to receive the slice of earth which is thrown upon it by the breast or turn-furrow of the plough.”

Secondly, in certain modes of mounting the share to admit of its being raised clear of the ground when required. In a bracket frame secured to the right side of the plough is formed a socket “for receiving a stem,” “which is capable of being adjusted to any required height.” Through the lower end of the stem a pin passes, to which the forward share is keyed, such pin being “capable of receiving an axial motion, and of imparting that motion to the share,” “but the share is prevented from moving backwards in an opposite direction out of the position in which it is drawn by reason of a shoulder on the stem,” “bearing against the back of the share when the share is in a position for working.” To the same pin a crank lever, the upper arm of which is connected by a rod to a hand lever, having as its fulcrum a pin on the side of the plough frame, is keyed, “and a connection is made between the lower arm of the crank lever and the share,” “which will ensure the simultaneous movement of both the crank and the share.” This arrangement of levers will admit of the share being raised out of the ground when required.



A similar result may be obtained by a modification of the above. "In this instance the stem and share are formed in "one piece," and the socketted frame, which carries the share, and which is prevented from being depressed below a given line by means of a check piece attached to the plough beam, is hinged to a clamp, by which it is secured to the plough beam, such socketted frame having an arm projecting, to which is attached the rod leading to a hand lever.

[Printed, &c. Drawing. See London Journal (Newton's), vol. 41 (continued series), p. 530. Mechanics' Magazine, vol. 57, p. 336.]

A.D. 1852, May 4.—No. 14,115.

GATLING, RICHARD JORDAN.—A machine for sowing grain, the wheels whereof "are attached to an axle divided into "two parts, so combined that each half axle can be made to "revolve with its wheel or not at pleasure," "by means of "a clutch upon the axle near the nave of the wheel, which "clutch may be put in or out of gear at will." From the wheel end of these half axles rotary motion is communicated to conveyers, one of which lies at the bottom of each seed hopper, and has a spiral rod terminating in an aperture in the front of the hopper, whence, by the rotary motion of the conveyor carrying the seed towards the mouth of the delivery aperture in a determinable quantity, the seed is caused to fall through a spout of leather or other suitable material, which connects the hopper with a drill plough, and to be "delivered "in the drill in single grains, and at certain distances apart;" "the ploughs are of metal castings made hollow, the lower "part terminating in the mould board," and "are hinged to "the frame of the carriage in such manner that they can be "raised or lowered by the attendant, either singly or all together, by means of chains; various kinds of manure may be deposited in the earth by this machine.

A modification of this machine is described, wherein the ploughs "are placed behind the axle, as also the hoppers, "so that in order to clear an obstruction it is only necessary "to raise the frame by means of the handles at the back. The "chain-work is thus superseded, and also the appliances "necessary for disconnecting the axles from the wheels. Either "machine may be employed with advantage as a 'cultivator'

" after the seed has vegetated by running the ploughs between the drills."

[Printed, &c. Drawing. See *Mechanics' Magazine*, vol. 37, pp. 351, 415.]

A.D. 1852, July 6.—No. 14,201.

**POOLE, MOSES.**—(*A communication.*)—The invention relates, first, to improvements in reaping and mowing machines. The points or guards supporting the blades or cutting instruments have recesses formed in them, into which portions of straw " or other materials being cut may pass, and which, without such provision would tend to clog or choke the cutters and their guards," the recesses being at all times cleared of any such materials by the action of projections fixed to the under side of the cutter-bar. The improved machine is worked by a crank handle on a shaft or axis carried by standards on the framing. On the other end of this shaft is a bevelled toothed wheel taking into and driving another bevelled pinion on a crank axis, which is connected by means of a connecting rod to one end of a bar, which vibrates on a fixed centre, and at its other end is connected by a pin to the centre rod. The machine is caused to travel forward as it performs its work by means of a band, which connects a band wheel on the crank handle shaft with another band wheel on the axis of the running wheels. " The novelty of this machine is its general combination."

Secondly, the invention relates to a roller or clod-crusher, the novelty in which " consists of the combined use of parallel discs and scrapers, the depth to which the discs descend into the land being controlled by the wheels on the land." These discs, which are of thin metal, " are kept at suitable distances apart on an axis by rings or other suitable instruments;" whilst the scrapers or knives are " of suitable forms and dimensions, to enter between the discs to remove from them the earth which is cut and raised by them."

[Printed, &c. Drawing. See *Repertory of Arts*, vol. 21 (*enlarged Nov 1852*).  
r 222. *Mechanics' Magazine* vol. 38, p. 214.]

A.D. 1852, July 6.—No. 14,211.

**SANG, FREDERICK.**—"Apparatus for cutting, sawing, grinding and polishing."

Various apparatus for cutting, grinding, and polishing wood, stone, &c. are described. One part of the invention refers to

the use of endless saws for such purposes, and under this head a machine is described for "cutting standing corn or grain or grass or other crops which may be cut with a sickle, hook, or scythe." An endless band of steel runs over four rollers so arranged that the band is led along at a suitable height above the ground. Suitable fingers are mounted to guide the crop to the cutter, which may be serrated, or may be kept sharp by stones fitted in the frame in suitable positions. The cutter is kept up to its work by other rollers. The cut crop is received by an endless travelling apron which deposits it at the back of the machine. The horse walks behind the machine, and the cut crop is deposited at each side of his track. An endless flat chain carrying knives may be used instead of the endless band.

[Printed, 1s. 10d. Drawings. See *Mechanics' Magazine*, vol. 55, p. 76.]

A.D. 1852, July 15.—No. 14,219.

BURRELL, CHARLES, and GIBSON, MATTHEW.—"Reaping machines."

[No Specification enrolled. Letters Patent printed, 4d.]

A.D. 1852, July 29.—No. 14,243.

MARTIN, JOHN.—An improved implement having rotary hoes, or two sets of four actual working hoes or earth-rusers, carried by two horizontal shafts or hoeing spindles, which run in end bearings in a separate frame behind the main apparatus; such separate frame being supported on "four plain free running wheels," "adjustable for the purpose of regulating the depth of the hoeing action," by means of clamp nuts. These hoeing spindles derive motion, through the medium of working machinery, to which they are connected by shafts and universal joints, from the wheels that carry the main body of the implement. The separate apparatus or frame carrying the hoes is composed of two main transverse beams, connected by overhead bridge pieces. These transverse beams are steered by means of a duplex lever handle, attached to the hind projecting end of a central longitudinal shaft, which is connected by a short lever and link to one of the cross bridges. An arrangement of mechanism is described whereby the entire machinery may be thrown out of gear, and the hoes simultaneously raised from the ground. A set of four eccentric chain pulleys are

fixed upon a transverse regulating shaft, upon which is keyed a lever handle. "These pulleys have each a separate pendant "chain" "attached to and passed over them, two of them "being connected with the bridges," "and the other two connected with the ends of "weighted levers"; "the opposite "ends of the levers work in fixed centres," "and support the "outer ends of "horizontal shafts," on the two opposite ends of which are fixed two toothed pinions, which gear with spur wheels on the inner projecting bosses of the running wheels. "A detent and ratchet wheel" "is employed for "keeping the hoes at any required elevation, and for retaining "the pinions" when out of gear with the spur wheels,

[Printed, 6d. Drawing. See *Mechanics' Magazine*, vol. 58, p. 136; *Practical Mechanics' Journal*, vol. 5, p. 282.]

A. D. 1852, September 18.—No. 14,296.

SMITH, WILLIAM.—"Machinery for reaping."

The machine described is mounted on two large bearing wheels, and a small steering wheel in front, which is manipulated by a lever. The cutters are rotary and are formed of curved sickle shaped arms on central vertical spindles; they have serrated edges. A row of these is mounted along the front of the machine, and they act against fixed angular cutters. They are rotated by endless chains round pulleys on the cutter spindles and pulleys on vertical spindles behind driven from the axle of the bearing wheels. Over the cutters is an endless band fitted with projecting spikes, which carries the corn as it is cut towards one side, and in front of the machine an arm is arranged to project, which partly lays the corn and assists the action of the cutters thereby. The height and angle of this arm is adjustable. The machine is driven by a horse pushing it forward from behind.

[Printed, 10d. Drawings. See *Mechanics' Magazine*, vol. 58, p. 266.]

A. D. 1852, September 30.—No. 14,307.

LESTER, SARAH.—(*A communication from Michael Joseph John Donlan.*)—"The invention consists, first, of improving "ments in treating the seeds of flax and hemp," and improving their growth, by steeping them in, and thus causing them to be coated with, the following preparations, when cold, after the ingredients have become combined by having been heated

and kept up to 250 F. for the space of six hours:—1 gallon of sperm oil; 1 gallon of Gallipoli oil; 1 gallon of Greenland whale oil; 1 lb. of common salt; 1 lb. of powdered alum;  $\frac{1}{2}$  lb. of saltpetre;  $\frac{1}{2}$  lb. of Roman alum.

Secondly, in certain mechanical processes, which the straw of flax and hemp are caused to undergo in a dry state, whereby the process of "ratting" is rendered unnecessary; and also in saturating the flax and hemp of commerce with a certain preparation of materials.

[Printed, 4d. No Drawing. See *Repository of Arts*, vol. 22 (*enlarged series*), p. 279, *Mechanics' Magazine*, vol. 58, p. 298.]

A.D. 1852, October 7.—No. 14,319.

RANDELL, JOHN REED.—"Cutting and reaping machines."

The frame of the machine is carried by one large bearing wheel, in front of which the horse is harnessed, and a small wheel on the other side. Motion is given from the running wheel to a reciprocating bar carrying angular cutters, each of which works across a horizontal slot in one of a series of pointed guards or fingers. Behind the cutters is a platform from which the cut crop is raked. There is a rotating gatherer over the cutters.

In a modification of the apparatus specially intended for cutting grass, the platform and gatherer are dispensed with, and the end of the frame carrying the cutters is supported by a sledge, the height of which can be varied. At the side of the cutters next the running wheel, there is a board resting on the ground, and allowed to rise and fall in its supports so as to adjust itself to inequalities. This is intended to clear away the cut grass from the side, and prevents its clogging the cutters. The cutters have openings in the blades, to allow cut grass, &c. to fall through. The guard teeth may be similarly formed.

[Printed, 8d. Drawing. See *Mechanics' Magazine*, vol. 53, p. 387.]

A.D. 1852, October 14.—No. 14,321.

BROOMAN, RICHARD ARCHIBALD.—(*A communication.*)—"Mowing, cutting and reaping machines."

The machine is supported on one bearing wheel, in front of which the horses are harnessed, and several sledge runners, placed underneath the finger bar. The guard fingers are of spiral shape, curved above and flat below, to enable them to

keep close to the ground. The cutters are angular and double-edged. They reciprocate in slots in the fingers, above and below which the fingers are hollowed out to allow pieces of cut grass, &c. to be discharged. There is a revolving gatherer, the arms of which have rakes thereon. When the machine is used for cutting grass it delivers direct on to the ground behind; when corn is being cut, a platform is added, and there may be a rake working across the platform. To assist this the platform may be inclined, or inclined bars may be fitted thereon. To clear the track at the side, against the return of the machine, a curved scraper board is attached to the back of the machine. To raise and lower the machine, the wheel may be mounted in a frame which can be fixed to the main framing of the machine at the height required. Or the pieces carrying the wheel may turn on centres and be capable of being fixed in different positions for the same purpose.

[Printed, &c. Drawing. See *Mechanics' Magazine*, vol. 53, p. 375.]

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## PATENT LAW AMENDMENT ACT, 1852

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1852.

A.D. 1852, October 1.—No. 44.

**HODGSON, JAMES.** —“Machinery for draining land.”

A steam engine is mounted on a carriage in such a way that it propels the carriage and also works the drain-cutting apparatus. This consists of a vertical cutter and a second tool which is shaped so as to enter the ground below the mass separated by the cutter. The two tools are raised simultaneously, lifting the mass of earth which is forced out at one side by a ram or presser. The propelling apparatus is so arranged that the carriage is moved forward after each cut, and remains stationary while the cut is being made. No details are given of the manner in which the above improvements are to be carried out, nor are there any illustrative drawings.

[Printed, &c. No Drawings.]



A.D. 1852, October 1.—No. 72.

WILKINS, EDWARD.—“Distribution and application of water” or other liquid manure to promote vegetation.”

Firstly, modes are described for distributing water or liquid manure as adapted for the purposes of a hot-house or flower bed.

Secondly, a mode of applying the invention to the cultivation of mangold wurzel, turnips, and other plants and trees which are usually grown in rows, by laying down, from end to end of each row, angular troughs, having perforated boards, or metal, glass, or earthenware plates, laid their whole length, whereby the water or liquid manure, when supplied from a tank or reservoir, by means of a plug or pipe at one or both ends of each row, will be carried along by the trough, and transmitted for distribution through the perforations in the plates or boards; or, instead of an angular trough, half-round drain pipes, having perforated boards or plates, or tiles, laid therein and along their whole length, may be employed.

Thirdly, a mode of applying the invention to bulbous or tap-rooted plants, by means of “a trough formed of clay, wood, earthenware, or other suitable material, and of such a shape as that such trough may surround the bulb or tap root,” the water or liquid manure, as in the former cases, being distributed through a porous or false bottom; or, in some cases, the porous or false bottom may be dispensed with.

Lastly, a mode is described of distributing liquid manure to hops or growing trees, by inserting into the ground, “in the centre of or near to each hop hill, or near to each tree, a tube or pipe, of any suitable material, of a funnel shape, and of a length sufficient to reach below or near to the root of the tree or hops;” such funnel-shaped tubes being supplied with liquid manure, by means of cocks or plugs, from pipes or tubes extending over the ground, and connected with a tank or reservoir of liquid manure.

[Printed, &c. Drawing.]

A.D. 1852, October 1.—No. 79.

SMITH, HENRY.—Reaping machines.

The cutters employed are “star-shaped.” A row of these is set under a fixed blade along the front of the machine, and they are actuated by an endless chain passing alternately on *one or the other* side of the spindle of each cutter, and over a

pulley at the side, actuated by toothed gearing from a large running wheel at one side. On the driving side of the machine there is a projecting guard, to raise any laid corn and bring it to the cutter. There are also projecting fingers to guide the crops to the cutters. The frame in which the cutters are set can be adjusted to any height from the ground by means of a bell-crank lever, the end of which is worked by means of a screwed rod. Above the platform on which the cut crop falls is a "reel furnished with tines" on projecting arms. This is actuated from the running wheel, and serves to carry the cut crop back on to the platform. To suit the height of the cutters, the arms of the "reel" may be "capable of elongation" and contraction" or the vertical support on which it rests may be in two pieces, locked together. The crop is delivered over the end of the platform by a roller fitted thereto. This roller has an intermittent motion given to it by a cam which shifts its driving band to or from a fast or loose pulley. The crop may be thus delivered on to the ground, or to a second platform running on wheels behind the machine. Above this platform is a frame from which are suspended arms carrying rakes. By means of a cam, driven from the running wheels, and acting on a short arm on the shaft from which the rakes are hung, an occasional oscillating movement is given to the rakes, which then carry the crop across the platform and deliver it at the side. Any other movements than this may be given to the rakes, or an arrangement to be driven by a winch handle may be employed.

[Printed, *Is.* Drawings.]

A.D. 1852, October 1.—No. 89.

MARSHALL, JAMES NICHOLS.—"Wheels for carriages and other vehicles."

The following is the whole Final Specification :—"First, an improved perpendicular wheel for carriages and other vehicles, on the scale of five feet, made of wood, with an iron cog tire."

"Second, twenty wooden rails attached to an iron plate, with cogs to fit the cogs of the tire on the wheel, each nine inches long, to girt the wheel, three inches deep, and the same width as the iron tire. The rail has a stud bolt, with a pivot on each end, fixed in the centre, working in two steel collars bolted each side of the tire. These collars leave

" room for the rail and revolvers to lay flat on the ground.  
 " and by them are carried round the wheel and kept firm in  
 " their places. An iron pivot passing through the wooden  
 " rail is fastened to the steel bolt in the centre for the rail and  
 " wheel to turn on the revolver, there being as many revolvers  
 " as there are rails. The revolvers are turned, twenty-seven  
 " inches girt, horizontal top and concave bottom, with iron  
 " bands. The pivot from the rail passes through the centre  
 " of these revolvers, is screwed on the rail, and acts jointly  
 " with the rail and wheel. These revolvers may be made  
 " either of iron or wood, the wood acting better for a plough,  
 " &c., and the iron for the common road."

[Printed, &c. No Drawings.]

A. D. 1852, October 1.—No. 92.

LAWES, THOMAS.—"Improvements in the manufacture of  
 " agricultural implements, or an improved agricultural im-  
 " plement," consisting of a "cylinder or roller of iron or  
 " other suitable material, on and around the whole circum-  
 " ference of which a quantity of tynes are fixed;" which  
 " tynes or prongs will in succession dig or turn up the earth  
 " as the cylinder revolves over the ground, when drawn by  
 " horse or other motive power. Cleaners are provided for the  
 " purpose of throwing off the earth from the tynes and roller.  
 " These consist of pieces of iron, suspended from a rail above,  
 " and are fitted and kept in position by springs, one in each  
 " curved space on the roller between the tynes. The weight of  
 " the cylinder or roller may be increased, if required, "by  
 " hanging weights on projections from the shaft inside the  
 " roller." An arrangement is provided, consisting of "a plat-  
 " form or double skid," connected by chains with a roller  
 " resting on the shafts in front of the machine, whereby the  
 " cylinder can be raised, and the tynes lifted out of the earth,  
 " when it is required to turn the machine; "the same opera-  
 " tion," however, "may be performed by many mechanical  
 " contrivances."

[Printed, &c. Drawings.]

A. D. 1852, . . . . .—No. 92.\*

LAWES, THOMAS.—Disclaimer and Memorandum of Altera-  
 " tion to No. 92, A. D. 1852. Filed August 22, A. D. 1855.

The Specification concludes with the following words :—

" Having described the nature of my invention, and the manner in which it is to be performed, I claim the method described of tilling or turning up the ground by means of tyues or prongs, projecting from a rotating cylinder, as herein before set forth." These words the patentee believes to be liable to misinterpretation, and he therefore disclaims them.

[Printed, &c. No Drawings.]

A. D. 1852, October 2.—No. 153.

**BROWN, DAVID STEPHENS.**—" An agricultural implement for tilling the soil." Round the circumference of a cylinder are attached elastic arms, or arms " provided with spring joints at the respective ends where they join the said cylinder," to the outward extremities of which arms are affixed rows of teeth, so arranged that one of such rows may always be in contact with the ground, however much the said elastic arms may be bent." To the extremity of one of the arms a circular brush, or scrapers, may be attached. The cylinder is suspended on either side, and has its bearings formed by the respective ends of two beams, which are supported, and respectively revolve by means of a pivot, on pillars, affixed to a carriage, mounted upon wheels, and containing " a steam engine or other motive power," whence revolving motion is given to a wheel on the axle of the cylinder, and consequently to the cylinder and its arms, by means of a band. " Motion may," however, " be communicated in a direct manner to the said cylinder by means of a handle worked by manual labour or otherwise." To the other ends of the said beams is respectively suspended a weight, " by means of which the pressure of the said cylinder against the ground is regulated." " By the action of the cylinder thus arranged the soil is scratched by the teeth to any depth, and then thrown back and swept by the said teeth and brush in a fine pulverized state behind the instrument." Whilst the cylinder is revolving, the whole instrument is being constantly drawn forward by a rope, which is anchored at one end, and acted upon by a winch, affixed to the before-mentioned carriage, which winch has motion given to it from the steam engine " in the said carriage or otherwise."

[Printed, &c. Drawings.]

A. D. 1852, October 2.—No 169.

POOLE, MOSES.—(*A communication from Mr. Hussey.*)—"Machinery for mowing and reaping." Improvements on a former invention of the communicant (presumably No. 13,924, A. D. 1852).

The machine is of similar construction to that described in the Specification above referred to, with the following improvements:—

1. The gearing by which motion is communicated from the running wheel to the cutters is boxed in on all sides, and the running wheel is entirely outside this casing.

2. The cutters are "nearly in a line" with the axle of the running wheel, or at least within the circumference of the wheel. The object of this is to allow the wheel and the cutters to rise and fall together.

3. The cutter bar is made with an "offset downwards," so that the cutters may be brought close to the ground.

4. The fingers are of chilled cast iron, so as to give a hard surface to the inside of the slots within which the cutters play.

5. "Spurs" are affixed to the under side of the cutter blades, to clear away from the slots in the fingers any clogging matter.

Besides the above, it is stated that the platform may be inclined at the back when dry corn is being cut, to prevent its slipping off; also that the machine may be altered to cut a high or a low stubble "by shifting the bolts which confine the "main axle boxes into different holes,"

[Printed, &c. Drawing.]

A. D. 1852, October 2.—No. 193.

RIDLEY, RALPH EBRINGTON.—"Cutting and reaping machines."

Improvements on No. 13,962, A. D. 1852. The cutters are of the same sort as those described in the above Specification. They are actuated by a cam-wheel of special form, on a shaft driven by multiplying gearing from the axle of the running wheels. The cam runs between friction rollers on a bar from which motion is communicated to the cutters. Instead of this the shaft as above may have cranks thereon, which give motion to the cutters by connecting rods and chains passing over pulleys on the cutter bar. The cut crop is received on a board behind the cutters, which has an intermittent move-

ment given to it by a stop on a wheel on the cam shaft and stops on levers connected to the board, so that it is partly tilted to discharge the crop in a sheaf on to the ground. Additional boards may be attached to this board if required, or it may be dispensed with, and the bottom of the sides of the machine be so formed as to guide the crop into a swathe on the ground. The front of the frame is supported on four small wheels which can be turned to guide the machine. The cutter-plate has at each end an upright piece with three holes by any one of which the plate can be bolted to the frame, so that the cutters may work at different heights.

[Printed, 10d. Drawing.]

A.D. 1852, October 4.—No. 208.

MANWARING, RICHARD, and HAMBLIN, THOMAS.—(*Provisional protection only.*)—"Ploughs."

The improvements consist, firstly, "in mounting the fore-wheels of ploughs on a cranked axle, so as to enable the wheels to adjust themselves to inequalities in the ground over which the plough is passing."

"Secondly, in a peculiar mode of combining the coulter and share to enable the plough to be worked on a hill side plough, and for turning the furrow either to the right or left hand." The coulters, which are suspended from centres attached to the beam, are capable of being alternately raised out of work, according to the direction in which the plough is travelling on the hill side; whilst the mould board is capable of being shifted from one side of the plough to the other.

"And, thirdly, of an arrangement for enabling the mould board to be adjusted to any required width of furrow," by means of a screw and socket.

[Printed, 6d. Drawing.]

A.D. 1852, October 5.—No. 221.

CROSSKILL, WILLIAM.—"Machines for cutting or reaping growing corn, clover, and grass."

The improvements described are two.

1. Placing the front running wheels of the machine "in a line with and as near as convenient to each end of the cutting apparatus" so as to keep the cutters at the same distance from the ground however uneven it may be.



2. Attaching brushes to the arms of the revolving reels which carry the cut crop from the cutters to the platform behind.

[Printed, 10d Drawing.]

A.D. 1852, October 5.—No. 245.

DRAY, WILLIAM.—"Machinery for reaping and mowing."

The invention comprises the following improvements.

1. "Combining the frame with the axis of the carrying wheels in such manner that by having a cog-wheel (on the axis of the carrying wheels, or one of them) and a train of wheels, motion is communicated to an upright axis, and from that axis to the cutters."

2. "Making exterior edges of the cutters of convex curves, in place of straight; and, combined therewith, the lower edges of the guides or passages through which the cutters work are made with cutting edges."

3. "Applying an endless band or strap, made up of angular bars, to receive the cut corn or other crops in front, and carry it up an inclination, and to drop it on to inclines arranged to drop it either immediately behind or at one side, and at intervals or continuously."

4. "Constructing the blades of the fan wheels with projecting teeth, so that they may act as combs or rakes on the crop, as it is brought to the cutters."

5. "Employing two guiding wheels in front, which are capable of locking on an axis, such arrangement admitting of raising the cutter frame by a lever, and also of its being put out of action."

6. "Applying shafts so that they may be at one time (when the machine is at work) towards one side, and at other times (when the machine is on the road) towards the middle of the machine." Also the "fingers or cutter guides" are grooved on both sides.

[Printed, 10d Drawings.]

A.D. 1852, October 6.—No. 261.

ABBOTT, WILLIAM.—(*Provisional protection only*).—"An unproved plough."

The whole provisional Specification is as follows:—"The principal object of the said invention is to save horse labor by reducing the friction incident to the ploughs now

“ in use. Under the old system of constructing ploughs a  
 “ large portion of the horse labor was occasioned by allowing  
 “ the left-hand side and under part of the plough to come in  
 “ contact with the ground. The improvement, therefore,  
 “ introduced by the said invention is accomplished by  
 “ removing all the left hand side and bottom part of the  
 “ plough behind the spill which takes the share, and in lieu  
 “ of this a wheel is fixed at the end of the beam, and the  
 “ handles are continued down to the bottom of the spill,  
 “ which gives sufficient strength to the plough. Another  
 “ part of the improvement is in the mode of fastening the  
 “ share to the spill. This is effected by passing an iron bolt  
 “ horizontally through the foot of the spill, and fastening it  
 “ with a nut.”

[Printed, &c. No Drawings.]

A. D. 1862, October 15. —No. 394.

NICHOLLS, ROBERT HAWKINS. —“ Horse-hoeing land.”

The invention consists:—First, in attaching “hoes points  
 “ and guide wheels” to a double horizontal bar, “by means  
 “ of stems in sockets, in which they turn each on its own  
 “ axis;” “the upper parts of the stems of the hoes are  
 “ cranked at right angles, to admit of a bar or connecting rod,  
 “ having sockets to receive the cranked stems of the hoes,”  
 being placed upon them, parallel with the “horizontal bar to  
 “ which the hoes are fixed.” “Two levers, which act as  
 “ handles to the hoe, are fixed, each by a pivot, to the hori-  
 “ zontal bar, and passing under the bar or connecting rod in  
 “ which the cranked stems of the hoes are placed, are fastened  
 “ to it, each by a pivot,” whereby the motion of the handle is  
 communicated to the cranks through the medium of the connect-  
 ing rod, which moves laterally in slots in the framework of the  
 machine, and the operator is thereby enabled to guide the hoes  
 with accuracy between the rows of growing crops. The axial  
 motion of the hoes and guide wheels may, however, be pro-  
 duced by any other suitable means.

Secondly, in the use of “turning points or cutting parts,  
 “ either as forming a part of the hoe,” “or as a separate in-  
 “ strument,” “and for turning in the land on an axis, or by  
 “ other means.”

Thirdly, in improved means of draught, the shafts being  
 connected to an axle or bar, having wheels attached to it by

vertical stems and moveable clutches, by means of two rods, "which cross each other, and are hung by rings or pins to allow of their motion as the horse varies in the draught; such axle or bar being connected by rods, working upon pivots, with the before-described horizontal bar; "by this arrangement steadiness of draught is given to the implement."

In reference to these improvements, the inventor says, "I do not confine myself to any specific arrangement of the parts, but claim the application and combination in any suitable manner of the within-described machine for hoeing land."

[Printed, *ed.* Drawings.]

A.D. 1852, October 21.—No. 467.

SMITH, JOHN.—(*Provisional protection only.*)—"A machine for the cultivation or clearing of land, and for digging potatoes or other roots."

"It is proposed to accomplish these purposes by raising the soil, rubbish, and roots by ploughshares affixed to the machine, and passing the same in one continuous direction over and along an inclined grating (also affixed to the said machine) by means of rods moved over the surface of the said grating by endless chains driven by one of the wheels supporting the machine, and finally depositing the same, or so much thereof as shall not then have passed through the said grating, in a riddle attached to the said machine, and there separating the said rubbish and roots from the residue of the said soil."

[Printed, *ed.* No Drawings.]

A.D. 1852, October 21.—No. 480.

FOWLER, JOHN.—"Machinery for draining land."

The invention relates to machinery for forming drains in land by steam power, and consists in so arranging the parts that "the boiler, steam-engine, and coulter or cutter are all combined and go together, the steam-engine giving motion to a drum to wind on a wire rope, and thus to move itself up to an anchor or fixed point on the land." The invention also includes an improved form of coulter, which is made "of less thickness at the back than the more forward parts" in order to reduce friction. The machine is furnished with an upright coulter and a shoe or share for forming the drain and

drawing a continuous series of drain tiles into it, like the apparatus described in Nos. 12,989 and 13,285. A steam-engine and boiler are fixed upon the carriage, which travels on four broad wheels, and carries at its front end a large drum. The end of a wire rope is conducted from the drum to the opposite side of the field, passed round a pulley attached to an anchor or holdfast, and then brought back and fastened to the frame of the carriage; so that on the drum being put in motion by the engine, it winds up the rope, and draws the machine towards the anchor. If greater speed be required, the pulley is dispensed with, and the end of the rope is secured to the anchor. When the machine has arrived at the anchor, the power of the engine is applied to turn a small drum, round which is passed a rope from an anchor situated at the place where the machine is to recommence its action; and as the carriage is thus drawn back to the opposite side of the field, the large drum pays out or delivers its rope in readiness for the next forward movement of the machine. The patentee states that for some purposes he prefers to perform the operation of delivering or paying out the rope from the large drum by turning the front wheels by any convenient gearing worked by the engine, so that the bite of such wheels upon the land shall act to drive the machine in the requisite direction.

[Printed, 1s. Drawings.]

A.D. 1852, October 21.—No. 482.

**FWLER, JOHN.**—"Reaping machinery."

The machine runs on three wheels, two large wheels in front, from which the power is derived to actuate the cutters, and one smaller one behind. The horses are attached to a cross-bar in front of the small wheel. Behind the cutters a fan blower is arranged, with a tube "properly formed to direct the current of air advantageously for laying or pressing the crop to the cutters." The crop is received on inclined rollers behind the cutters, furnished with prongs or forks which deliver the crop on one side of the machine.

[Printed, 2s. Drawings.]

A.D. 1852, October 21.—No. 483.

**FWLER, JOHN.**—"Machinery for sowing seed and depositing manure."

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The invention consists, first, in a mode of "combining parts" of machinery for depositing measured quantities of seed by "means of a vibrating measure," formed by suitable recesses or indentations in a seed-roller, to which vibratory motion is given by means of an arm, fixed to one of its axes, being connected by a rod to an excentric, the axis of which receives motion from one of the carriage wheels.

Secondly, in a "mode of combining apparatus or machinery" for depositing measured quantities of manure." This is effected by means of the bottom of the manure box being hinged at one side, whilst its opposite side rests upon a manure board, one end of which is connected by chains to pulleys, having a lever handle on their axis, whereby that end of the manure board is adjusted; the other end of the manure board is attached to the end of a lever, which is keyed on a rocking shaft, and has its other end connected by a rod to an excentric, the axis of which receives motion from one of the carriage wheels. By this arrangement, the bottom of the manure box is, during the progress of the machine, opened and shut alternately, and measured and regulated quantities of manure are thereby deposited.

[Printed, 10s. Drawing.]

A.D. 1852, October 30.—No. 579.

NEWTON, ALFRED VINCENT.—(*A communication from John H. Munny.*)—"Machinery for cutting corn and other standing crops."

The apparatus consists of two parts, a truck to which the horses are harnessed, and a two-wheeled frame carrying the cutters and connected to the leading truck by a bar hinged to the hinder carriage. The cutters can be adjusted to any height from the ground by a lever, fixed to the hinder carriage, and connected to a standard on the front truck by a pin taking into any one of a row of holes therein. Behind the cutter is a moveable platform on which the cut crop falls, and is removed by an attendant with a rake. In cutting grass &c. this is not required, and the crop is allowed to fall directly to the ground. In this case there is a scraper or board arranged so as to remove the cut grass, &c. from a truck in front of the running wheel. At the side of the machine and in front of the cutters curved runners are attached which prevent the points of the cutters

entering the ground where it is uneven. "The sickle is composed of a strong strait bar and a series of lozenge shaped teeth secured thereto." The cutting edges of the teeth are on both sides of the bar and the portions behind serve to cut grass, &c. that may be entangled in the apparatus. Besides the cutters there is a set of fingers, against the edges of which they cut.

These fingers are double, and are formed of two parts, one above and one below, united at front and back, but in the middle leaving an intermediate space in which the cutters work. There are openings in them to allow of the discharge of dirt, &c. The cutter bar is driven by gearing from one of the running wheels.

For cutting grass, &c. the cutter frame may be allowed to rest down on the ground.

A revolving reel of the usual sort may be employed or not.

[Printed, to Ed. Drawings.]

A.D. 1852, November 2.—No. 621.

**SAMUELSON, BERNHARD.**—"Improvements in breaking up and tilling land." This invention, which applies to circular grubbers, digging and subsoiling implements, "consists of forming the tynes or teeth of steel, and by preference each tyne is curved, and proceeding from its inner end it comes regularly to a point or chisel end at its outer end." In the improved machine, the bar or axis of the digging apparatus is included within an inner frame, to which the shafts for traction are attached, and which is hung on a bar, to which outer or quadrant frames, with travelling wheels attached, are fixed. The back of the quadrant is toothed and gears into pinions keyed on a bar revolving in the inner side frames, so that, by means of a winch, the inner frame with the digging apparatus can be raised or lowered. The inventor prefers to arrange the digging prongs in pairs "as they may thus be more firmly bedded between the centre plates," or digging wheels, which are hung upon a bar, or axis on which they move, and kept apart by washers. "Each of these wheels may revolve independently of the others, or they may all be bolted together, or be connected by a hollow shaft revolving on the said bar or axis, or that bar itself



" may revolve with or through the digging wheels." The inventor does not claim "steel digging prongs absolutely, nor "revolving prongs generally; but," he says, "what I do claim is, the use of steel prongs or teeth fixed to or moving on an axis or axes for the purpose of breaking up and tilling land."

[Printed, 10/. Drawing.]

A.D. 1852, November 3.—No. 626.

PHILLIPS, CHARLES.—"Machinery for reaping or cutting crops of corn or other crops."

Partly improvements on No. 8962, A.D. 1841.

Two modifications of the machine are described.

1. The machine is guided behind by a pair of handles, and is drawn by horses, &c. attached to a point at the side. It runs on two wheels, one outside the framework, from which motion is taken for the cutters, &c. the other, next the standing corn, within the frame. The cutters are of the sort described in the above Specification. Close above the ground, and projecting forward of the cutters, is a series of horizontal arms, carrying pulleys on their ends. Endless cords are stretched over these pulleys, and over others on the frame of the machine, arranged at the angles of a triangle one side of which extends from the ends of the arms to a point over the cutters near the top of the frame. Motion being given to the pulleys is by them transmitted to the cords. The arms are intended to raise laid corn, while the endless cords give it a motion upwards and backwards. After being cut, the corn falls on an endless web stretched over rollers in such a way that the portion next the cutters is inclined, while the rest is horizontal. A second endless travelling apron works behind the first, and the rollers carrying the two are geared together. An intermittent motion is given to these webs as follows:—The hindermost one has on it a series of rods stretched crosswise; a lever arm, having a to-and-fro motion from a segmental rack driven by a crank and connecting rod, is fitted at its end with a hook pivotted thereto: this hook passes over the ends of the rods in one direction, but catches them and draws them backward in the other. By a similar movement a flexible weighted bag is let down on and raised from the corn on the inclined portion of the web, to hold it thereon and assist its carriage forward. The second web is

cleared by a rake working across it, and raised by a cam and counterpoise weight at each backward traverse.

2. This machine is similar to (1), except as regards the arrangements for carrying the cut corn back from the cutters. The corn falls on an inclined platform above and over which is a segmental platform with a counterpoise so arranged that the segmental platform forms a continuation of the fixed one, or may be pushed down behind the same. Behind this is a sliding platform to which to-and-fro motion is given by a movement similar to that used in (1) for actuating the endless webs. As this platform slides forwards it depresses the segmental platform and receives the corn therefrom. It then moves backward, and arms with rollers enter guides at the sides which tilt the platform up, and cause it to deliver the corn on an endless travelling web below, which has an intermittent motion from a ratchet.

[Printed, 1s. 6d. Drawings.]

A.D. 1852, November 5.—No. 641.

HALL, COLLINSON.—“An apparatus to be used in the carriage  
 “ of solid and liquid bodies.” The invention has reference,  
 firstly, “to the construction and employment of a revolver or  
 “ carriage formed by one or more drums or cylindrical vessels  
 “ furnished with a central axis or gudgeon, and with projecting  
 “ rims or disks provided with shafts, traces, bands, straps, or  
 “ chains, through the intervention of which they may be  
 “ drawn or driven by horse, steam, or other motive power, the  
 “ inner surface of the said drums or cylindrical vessels when  
 “ more than one are employed in a revolver or carriage, being  
 “ connected if required by several rods or bands of metal,  
 “ gutta percha, or other convenient material, and the outer  
 “ circular surfaces thereof fitted if required to bags or recep-  
 “ tacles adapted to loose, solid, or fluid matters to be carried  
 “ in the said revolvers,” “and provided with doors, man-holes,  
 “ or valves, by which the said solid or fluid matters may be  
 “ introduced or discharged in such manner that the contents  
 “ of the said bags or receptacles shall partake the circular or  
 “ rotatory motion which is given to the rims, discs, or wheels  
 “ as the carriage is drawn or driven along the ground, exactly  
 “ as if they were contained in a simple cylindrical rolling  
 “ vessel.”

Secondly, the invention has reference to the construction and employment of "a train or series of carriages or revolvers similar to the above, which can be drawn by one and the same motive power, and which is formed by connecting the central axes or gudgeons of several of the said revolvers by rods, chains, bands, or other suitable contrivances."

These improvements are susceptible to various applications viz., "to the carriage and distribution of liquid manure, night-soil, urine, sewage water, distillers' wash, and brewers' grains, to land rolling, to the supplying of pure fresh or salt water for domestic use, and to the carriage of gunpowder, ball, and ammunition, flour, sugar, seeds, hemp, hides, corn, lime, and tallow, also to street sweeping, churning, and washing grains and roots," and also to "the watering of roads and other purposes."

[Printed, 8d. Drawing.]

A. D. 1852, November 6.—No. 665.

CHANDLER, THOMAS HICKS.—Hoes.

"This invention consists of combining winged cutters in pairs, so that the plants are guarded by the wings, whilst the land on either side is cut and moved. These improvements are peculiarly applicable for hand hoes, as well as for hoes drawn by power."

[Printed, 6d. Drawing.]

A. D. 1852, November 9.—No. 689.

REVIS, THOMAS.—(*Provisional protection only.*)—"Single seed drilling or dibbling machinery."

"When used as hand dibblers the droppers for dropping the seed may be made of part wood and part metal to render them lighter for the workman, and when applied to machine drills they may be made of all metal. The tubes are in two halves, screwed together with up and down joints. The funnel or reservoir designed to hold the seed is fastened on the outside on the top of the tube. The two irons, called the lifting and holding irons, are sunk in and screwed to the inside of the tube, extending and passing through the top of the funnel. A metal clasp is fixed on the holding iron, with an orifice at the other end, through which the lifting iron passes, and is prevented from springing when in action; the

“ metal portion of the tube is at the bottom in two halves of a pointed end, having a shoulder which is screwed to the shoulder of the tube.” “ Two pieces of metal, one for each half of the tube, of a semicircular shape, corresponding with the size of the inner circle of the tube,” “ are placed exactly opposite each other in the tube, flush with the top of it, and secured firmly from the outer side of the tube ; this piece, intended for the side of the lifting iron, is designated the receiver, being cut out in an oblong shape, and deepened at the bottom end to receive the seed ; the cavity thus formed is left very smooth.” The other piece of metal “ is denominated a strike, as it performs the office of keeping back the overplus seed on the return of the lifting iron.”

“ Instead of the above may be used a piston, passing up and down through the strike, receiving its action from a stud fixed in the up and down tube.”

[Printed, *ed.* No Drawings.]

A.D. 1852, November 9.—No. 697.

HUSSEY, ORED. — (*Partly a communication.*) — Reaping machines.

Improvements on a machine previously patented. (See No. 169, A.D. 1852.)

The cutters are caused to rest on spurs carried by a bar parallel with that to which the cutters are affixed, instead of resting on the fingers. These spurs are arranged above and below the cutter blades, and are bent down over the cutter bar to keep it in position. The spurs are cast on the bar. Also the blades are made with apertures therein or with sunk and projecting edges which act to clear the fingers from matter which might choke them up.

[Printed, *ed.* Drawing.]

A.D. 1852, November 12.—No. 726.

JOHNSON, JOHN HENRY. — (*A communication.*) — Reaping machines.

The improvements consist of a “ self-acting raker ” and a new form of cutter. The cutter consists of a “ zig-zag shaped ” knife, sharp both at back and front, smooth below and serrated above, “ riveted to a straight bar, over which it pro-

"jects on both sides." The object of this is that the cutting edge at the back may clear away any clogging matters.

The movement of the rake is somewhat complicated. It acts across the platform at the back of the cutters. "In the same vertical plane with the centre of the axle of one of the running wheels" is fixed a "vertical support" "having a rocking or partial rotatory motion in a footstep bearing at its lower end, while its upper extremity works in a horizontal pillow-block." In an opening in this support a bent lever is fitted, one end of which is connected by a ball and socket joint to the inside of the rim of a bevel wheel mounted on a horizontal shaft opposite the vertical support. The effect of this is to rotate the support on its axis to-and-fro, and also to give an up-and-down motion to the lever. An antifriction roller at the end of the bent lever works in a slot in a second lever connected to the shank of the rake. The upper end of the shank is connected by an iron rod to the top of the vertical support. A spring pressing against this rod serves to steady the action of the rake. An iron plate is suspended from an arm on the vertical support, and is moved to-and-fro by a rod from the lever attached to the rake shank and a pair of springs. The action of the apparatus is that the cut crop is brought by the rake against the plate. "By a partial turn of the vertical support the bundle is brought over the back edge of the platform, and as the rake becomes extended it is allowed to fall to the ground."

[Printed, 8d. Drawings.]

A.D. 1852, November 13.—No. 743.

FORBES, PETER.—"Sowing or depositing seeds in the earth."

The invention consists in combining a simple sowing apparatus with a common plough. "A short transverse shaft is placed in suitable bearings across the plough, just behind the mould board, and this shaft is fitted with a plain running wheel to work along the earth in the bottom of the furrow, in the track of the sole shoe. This shaft projects on one side, and has fast on such projection a small toothed pinion, revolving in the bottom of a seed holder," having a seed discharge aperture. "The seed is dropped just behind the line of the mould board, and immediately that

" it is dropped part of the furrow is undermined by a secondary  
 " cutter, or small mould board, and made to fall over in  
 " conjunction with a portion of the previous furrow, and  
 " cover up the deposited seed." A modification of the above  
 sower is described, suitable for potatoes or large seeds, wherein  
 the before-mentioned transverse shaft has placed upon it a  
 bevil wheel, gearing with a corresponding wheel fast on the  
 lower end of a vertical spindle, the upper end whereof revolves  
 freely through a flat stationary disc of metal, perforated with a  
 single hole; whilst a similar disc, fast on the spindle, is  
 perforated with a ring of apertures, each corresponding with  
 the single hole in the stationary disc. As the plough traverses  
 over the field, the potatoes, which are to be deposited in the  
 holes in the revolving disc, are, during the revolution of the  
 spindle, dropped separately through the hole in the stationary  
 disc, and thence into the furrow made by the plough.

What the patentee considers to be novel, and therefore  
 claims as his invention, is, first, "the general arrangement  
 " and construction of mechanism, apparatus, or means for  
 " sowing or depositing seed;" secondly, "the system or mode  
 " of sowing or depositing seeds, wherein the two separate  
 " operations of ploughing and seed sowing are simultaneously  
 " performed by one machine;" thirdly, "the application  
 " and use of an adjustable seed sower attached to a plough"  
 fourthly, "the application and use in ploughs of a secondary  
 " cutter or mould board for covering up deposited seeds;" and,  
 " fifthly, the system or mode of sowing potatoes or other  
 " large seeds by means of adjustable or variable rotatory  
 " cups."

[Printed, &c. Drawing.]

A. D. 1852, November 16.—No. 764.

CHRIPPES, THOMAS, the younger.—(*Provisional protection only.*)—The invention relates to "improvements in the means  
 " of tilling land, as regards the various operations of ploughing  
 " or digging up, harrowing, and preparing the land for the  
 " seed, manuring and sowing the land, and reaping the crop."

" The improvements in the means of effecting the above  
 " consists in constructing or placing a steam or power engine  
 " upon a frame mounted upon wheels or rollers, which should



" be of larger area than the engine, to enable it to travel with  
 " facility over ploughed fields, &c. Within this frame there  
 " is a drum for coiling up the wire-rope or connector of the  
 " plough, harrow, &c., and such drum may be situate at  
 " such a height as shall enable the rope to clear banks, hedges,  
 " or obstructions."

" The plough, harrow, &c., being thus connected to the  
 " drum aforesaid, will, by the movement of the rope or  
 " connector, be caused to operate in the required manner."

" For sowing, or for manuring with dry manure," the  
 " inventor says, " I attach to the frame of the engine a wire  
 " frame or sieve, working on guides, and attached at one end  
 " to the engine or its frame, and at the other to moveable legs  
 " or supports, the sieve being moved by the engine, and thus  
 " caused to scatter the seed or manure."

[Printed, 4s. No Drawings.]

A. D. 1852, November 22. —No. 812.

CROSSKILL, WILLIAM. — "Clod crushers, or rollers for  
 " rolling, crushing, or pressing land."

The improvements "consist in making the discs or cylinders  
 " of which a roller is composed of different diameters; the  
 " size of the hole in the centre of each disc or cylinder for  
 " receiving the shaft or axle increasing in the larger discs or  
 " cylinders, so that the distance from the outer circumference  
 " of the holes to the outer circumferences of the discs or  
 " cylinders is about the same in both the large and the  
 " small ones. By these means rolling discs or cylinders  
 " of different diameters will work side by side on the same  
 " axle, and the different sized discs or cylinders produce an  
 " irregular motion, which prevents the roller from clogging."  
 The patentee does not confine himself to any particular  
 details in carrying out this principle, but claims as his inven-  
 tion "all rollers consisting of discs or cylinders of different  
 " diameters, working side by side on the same shaft, and  
 " having the holes in the large discs of such a size that the  
 " small discs can touch the ground when the machine is placed  
 " on a level surface."

[Printed, 8d. Drawings.]

A.D. 1852, November 24.—No. 836.

OLDHAM, WILLIAM.—“Dibble drill.”

The frame is supported on two running wheels and drawn by shafts in front or otherwise. There is also a guide wheel in front and the usual arrangement for allowing the wheels to run back without operating the machine. By means of a clutch, the apparatus can be thrown out of gear. A pinion on the axle of the running wheels drives a crank shaft which by means of connecting rods works dibles swivelled to the ends of the rods. “A curved lever is fixed to the dibble rod, and “works within a movable perpendicular slide so as to make the “dibble partially revolve.” The slide is carried by a frame moved by a crank so as to carry the dibble forward after each hole has been made. The dibble is retracted by a spring. The seed is dipped out of a receiver in the usual way by a series of revolving cups which convey it to tubes with valves opened by studs and levers at suitable intervals. A second valve may be fitted in each tube to regulate the descent of the seed. The operation is completed by harrowing in the usual manner, or harrows may be attached to the back of the machine.

[Printed, 1s. Drawings.]

A.D. 1852, November 25.—No. 862.

JEFFREY, ANDREW.—(*Letters Patent void for want of Final Specification.*)—Reaping machines.

A frame is used supported on two running wheels and two guide wheels in front. A vertical shaft driven from the wheels carries a series of scythes which work between prongs fixed to the underside of the frame. A revolving rake, driven from the above-mentioned shaft, and “consisting of a set of “oblique arms with teeth fixed upon them at intervals,” serves to gather and deliver the crop.

[Printed, 4d. No Drawings.]

A.D. 1852, November 27.—No. 891.

WINTON, HARRY, and PARKES, FRANCIS.—“Agricultural “and horticultural forks, and pronged or toothed instruments and hoes.”

Any suitable metal, having been heated as for rolling in the the ordinary manner, “is rolled, stamped, pressed, or set

" down with a tilt or other hammer, or other known power.  
 " A small piece or part of one end of such piece, the piece  
 " or pieces, part or parts, is then passed or partially passed  
 " through a pair or pairs of particularly and peculiarly formed  
 " rolls, turned to and containing a certain number of sharp  
 " angles or edges, according to the number of prongs or  
 " blades, &c., or divisions, between the required number of  
 " prongs or blades, such angles forming an indentation  
 " between each intended prong or blade of such imple-  
 " ment: also is placed one or more blades, knives, slitters,  
 " or dividers, according to the number of divisions marked  
 " out, or indented at the back of the rolls, and transversely  
 " to the surface of the rolls. The knives, blades, slitters, or  
 " dividers referred to are, and the number of them in  
 " each such instance are, fixed and used in each instance  
 " as before described, according to the number of divi-  
 " sions, prongs, or blades required in each implement,  
 " at the end of a plane or bed, upon which works a slide or  
 " bolt horizontally driving the steel, iron, or other metal or  
 " metals against the knives, blades, cutters or dividers, as  
 " before referred to, so as to divide the piece or pieces  
 " where it may have been marked out or indented, or other-  
 " wise, or without being indented by the rolls or otherwise,  
 " or vice versa; or by stamp, press, hammer, or shears, or  
 " other known power, so as to divide the metal or metals in  
 " the manner, and for the purposes or the purpose as before  
 " described."

The patentee claims also the manufacture of "an improved  
 " hoe produced by the aid of this invention," the frame of  
 " which has " the originality of springing, so as to tightly keep  
 " the blades in the frame," thus enabling the workman quickly  
 " and easily to put in or change several light steel blades."

[Printed, 1s 2d. Drawings.]

A.D. 1852, November 29.—No. 902.

FOWLER, WILLIAM, and MCCOLLIN, WILLIAM.—(*Pro-  
 visional protection only.*)—"A machine constructed and  
 " adapted for a clod crusher and land cultivator." The un-  
 " proved machine consists of a frame on travelling wheels,  
 " which are made fast on their axle, and one of which has fixed  
 " on its face a number of small spikes, for the purpose of pene-

trating the land, and thus assisting to drive, through the medium of gear deriving motion from a wheel on the axle of the said travelling wheel, a series of wheels, which gear with each other, and are placed horizontally across the machine, for the purpose of carrying a number of vertical spindles, which are fixed one to each wheel respectively, and have knives or cutters affixed to their lower ends. " These knives being " constructed and adapted for that purpose, thus acquire an " action similar to that of the archimedian screw, and, revolving in pairs in reverse directions, break up the land; " and as no clods or other matter of any size can pass them " without being cut or crushed, they at once prepare the land " for the reception of seed. The knives are capable of working land any depth from one to six inches, " the depth being regulated by means of a lever, in connection with a plate, to which the upper ends of the vertical spindles are attached.

The inventors say, " we claim as our invention the application of the principle giving a revolving action to the " spindle, and the construction of those spindles, and of the " knives and the adaptation of the knives for the purpose of " breaking up land and preparing it for seed. We do not, " however, confine ourselves to the precise details, provided " the peculiar character of our invention be retained."

[Printed, *id.* Drawing.]

A.D. 1852, December 3.—No. 949.

BETHELL, JOHN.—The improvements relate to machinery for excavating hills for the formation of railways, and are also " applicable, when suitably arranged, for digging or cultivating land." They consist principally in adapting to a steam engine, mounted upon wheels, and " of the kind usually " employed for agricultural purposes," a rotary digger, consisting " of a drum or shaft, round which are arranged in a " helical direction a number of prongs or tines." The digger, which derives motion by a pulley on its shaft being connected, by means of a band, to a pulley on a crank shaft actuated by the engine, turns in bearings at the outer end of a lever frame, which is mounted, and moveable in a vertical direction, on the said crank shaft; "a set screw or other " suitable and convenient contrivance," being provided " for " holding up or supporting the frame and digger at any given

"point while in operation." In excavating, the earth, as it is cut away from the bank or hill, falls on to a rotating disc, whence it may be removed either by a "chain buckets or by "hand labour." On the axle of the hindermost running wheels is fixed a toothed wheel, which gears into, and is driven by, an endless screw on the lower end of a vertical shaft, on the upper edge whereof are fixed handles, whereby, as all the running wheels are connected together by rods, the machine is caused to move slowly forward as the work progresses. "When the machine is required for digging or "cultivating land," "the rotary digger is placed behind" the engine, "and so arranged that it may be lowered on to "the ground, and upon rotary motion being communicated "to it, the tines will cut away the ground and throw it "backward. While the machine is in operation, it is drawn "slowly over the land by horse or other power." The inventor claims as his invention:—"First, the general combination and arrangements herein described, or any mere "modification thereof when employed for similar purposes." "Secondly," the inventor says, "I claim particularly the "use and application of a rotary digger at the end of a lever "arm or frame so arranged that the rotary digger may be "raised up in a vertical direction, so that it may be enabled "to cut or dig away the face of a hill or bank for a considerable extent in a vertical direction." "Thirdly, I also claim the use and application for digging "or cultivating land of a rotary digger, as above described, "when worked by steam power."

[Printed, Ls. Drawings.]

A.D. 1852, December 6.—No. 965.

MURPHY, DENIS JOHN.—(*Provisional protection only.*)—"An improved agricultural machine," called by the inventor "The Archimedean Agricultural Machine." The invention consists of an improvement upon a machine, a model of which was exhibited in the Great Exhibition held in London, A.D. 1851, and which consisted of only one cylinder, armed with cutters, and now termed by the inventor "The Single-action Archimedean Agricultural Machine."—"The further "improvement, founded on the same principle, of the double-action archimedean agricultural machine," which forms the

subject of this invention, "consists of two cylinders, armed  
 "as before, worked at the same time and by the same power,  
 "whether that may be steam or horse power, or even by  
 "manual labour alone, according to the size and dimensions  
 "of the machine employed. The first cylinder cuts the soil  
 "at any required depth in a direct line with the motion given.  
 "The second cylinder cuts it at right angles to the first cutting,  
 "and turns up the earth to be crushed by the clod breaker  
 "attached to the carriage by a toothed rack and wheel,"  
 "whereby the same can be elevated or depressed, "and, finally,  
 "it is pulverized by the common harrow, which is also con-  
 "nected to the machine by chains." The cylinder, which  
 "can be adjusted by means of screws to regulate the depth to  
 "which the soil shall be acted upon, derives an accelerated  
 "motion through toothed gear deriving motion from the travelling  
 "wheels. "The same principle, that of an armed cylinder  
 "of reduced dimensions, may also be adapted for manual  
 "labour in the shape of the common wheelbarrow used in  
 "gardens, and which," the inventor says, "I intend to apply  
 "as an implement to be employed at the diggings in Australia  
 "and California, instead of the pickaxe."

[Printed, &c. Drawing.]

A. D. 1852, December 18. —No. 1107.

EAST, WILLIAM.—"Machinery for crushing clods, for dibbling  
 "and drilling land, and sowing seeds."

The apparatus is mounted on a frame carried by a pair of  
 running wheels. From the side of these wheels motion is given  
 to a number of wheels carrying dibles set radially and free to  
 turn in their sockets. On each dibble is a cross-bar, which,  
 as the dibble is leaving the ground, strikes against a stop and  
 thus causes the dibble to rotate and twist out of the hole.  
 When drills are required the wheels are removed and a set of  
 fixed shares substituted. The wheels may also be used for  
 clod-crushing, &c. For sowing there are a number of seed  
 boxes, one to each dibbling wheel. The seed is fed from a  
 hopper into the box, against one side of which is a revolving  
 circular plate with countersunk apertures round its rim.  
 These take up the seeds and deliver them to a "depositor  
 wheel" at the other side which carries them round until they



come opposite an opening at the bottom of the casing, when they are discharged into the holes prepared by the dibbles, or the furrows cut by the share.

[Printed, *ed.* No Drawings.]

A. D. 1852, December 24. — No. 1155.

BURCH, JOSEPH. — "Machinery for reaping, loading, stacking " and storing grain," &c.

1. The crop is cut by an apparatus consisting of a pair of discs mounted horizontally one above the other, slightly eccentrically, and fitted with hooked cutters which act with a shearing action as the discs revolve in opposite directions. The object of setting them slightly eccentrically is that the " sickle points on the advancing side of each disc cutter shall " project for the purpose of effectually gathering in and " cutting the standing crop at each side." The cutters are driven from the bearing wheels of a frame drawn by horse or steam power, or pushed forward by a horse harnessed in shafts behind. It is steered by guide wheels or rollers under the cutters, and moved by a lever handle.

2. For loading, &c. an upright frame is used, carrying rollers and an endless web thereon with a drum and handle for driving the same. For loading in the field, the frame may be attached behind a cart, motion being given to the web from the bearing wheels of the cart.

[Printed, *ed.* Drawing.]

## 1853.

A. D. 1853, January 18. — No. 122.

UNDERHAY, FREDERICK GEORGE. — (*Provisional protection only.*) — "Machinery for mowing or cutting corn and other " crops."

The whole Provisional Specification runs as follows :—

"This invention consists of employing a cutting blade or " blades (such as a man uses when mowing) affixed to a lever " extending from the side of a carriage. One of the wheels " of the carriage gives motion to a cranked axis from which " is derived a quick to and fro motion to the mowing blade " similar to the action of a man's arms."

[Printed, *ed.* No Drawings.]

A. D. 1853, January 21.—No. 158.

CURTIS, WILLIAM JOSEPH.—“Excavating or digging earth, “ and for carrying or delivering the soil.”

1. Machine for excavating a canal or a cutting for a road or railroad.

2. Machine for cutting a drain or trench in the ground. A portable or locomotive engine draws forward the carriage containing the digging apparatus, and at the same time gives motion to upright picks, like stampers, and actuated by wipers. By these the ground is broken up. In some cases the engine is provided with a barrel to wind up a rope fastened to a distant point. The digging apparatus is furnished with two sets of picks. The first set penetrates a short distance into the ground, and the broken soil is taken up by a fixed scoop or shovel “ somewhat like a ploughshare ” and discharged on one side of the trench. The second set of picks penetrates deeper and the loosened earth is thrown by another scoop or shovel on the opposite side of the trench. Any desired number of sets of picks and shovels may be employed.

3. Machine for filling in the trench cut by the machine first described. It is supported at the middle of its length by a broad wheel with ribs on its periphery, and at the hind end it is carried by a roller. It has a scraper which draws the soil into the trench, and stampers like those above mentioned, to ram it down.

4. Machine for excavating a dock or other work under water.

5. Machine for excavating soft land not requiring the aid of picks. Two locomotive engines travel on elevated railways at the sides of the ground to be excavated. A long frame, supported above the ground by rollers or broad wheels, extends from one locomotive engine to the other, and carries an endless series of trays, buckets, or small waggons, by which the earth raised by a “ quadruple plough ” is received and discharged. The plough is drawn to and fro by means of double drag ropes, connected to a winding drum on each engine, and fastened at their ends to a small barrel on each end of an axle which extends horizontally across the middle of the plough-frame. When this axle is turned by means of a hand-wheel, the small barrels take up the drag rope on one side and let out the drag

rope on the opposite side, and thus the plough is steered in either direction. The plough frame is supported at each end by a roller, and at the centre by wheels which travel on the frame of the soil-delivering apparatus. At each extremity of the plough-frame are fixed two ploughs with an inclined plane or sole-plate between them, up which the earth rises and passes between curved guide plates into the trays or waggons of the delivery apparatus.

The soil-delivering apparatus may be used when excavating by hand-labour, the men working in line, and pitching the soil into the trays or waggons as they pass in constant motion.

[Printed, 2s. 6d. Drawings.]

A. D. 1853, January 24.—No. 171.

**BRINSMEAD, HENRY.**—“Reaping all kinds of corn.”

A row of revolving circular cutters with recurved teeth is set between two comb bars with their points projecting forward and meeting in front of the cutters. The cutters are revolved alternately in opposite directions by a rope passing in and out over pulleys on their spindles. The cut corn falls on an inclined sheet-iron table, below which are revolving belts with pegs passing up through slots. By these and a second set of similar belts it is carried to and deposited on a disc, set on an inclined axis, and divided radially by partitions; as each compartment is filled the corn is deposited on the ground by a partial revolution of the disc. The machine is drawn by horses in front at one side.

[Printed, 3d. Drawing.]

A. D. 1853, January 27.—No. 203.

**ALABASTER, CHARLES HENRY.**—(*Provisional protection only.*)—“Ploughs.”

The whole Provisional Specification runs as follows:—

“In order to lessen the drafts of ploughs I place one or more wheels or rollers immediately behind the share, whereby the share is prevented from dragging along the ground.”

[Printed, 4d. No Drawings.]

A.D. 1853, January 31.—No. 262.

COMINS, JAMES. — "Clod crusher, land presser, or pulverizer."

The invention consists in "the combining together of two or more sets of rollers mounted upon distinct and separate axes, so arranged and disposed that each set of rollers take into the spaces between another set, "so that as each of the separate rollers upon one shaft rotate they will have the effect of cleansing or removing the earth which may adhere to the rollers upon the other and opposite shaft." The inventor remarks that, for the purpose of transporting the machine from place to place, ordinary wheels may be affixed to any convenient part of the machine; "and further, if necessary, a grass or clover seed machine may be attached to the above-mentioned clod crusher, land presser, or pulverizer, and motion imparted thereto in any suitable manner."

[Printed, 8d. Drawings.]

A.D. 1853, February 9.—No. 342.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—(*Provisional protection only.*)—"Apparatus for digging, excavating, or removing earth."

The following is the whole Provisional Specification:—

"The machine or apparatus which forms the subject of the present invention is intended more particularly for digging or cutting ditches or drains, and removing the earth therefrom, and consists principally of a rotating wheel, to which a number of shovels are attached. This wheel is mounted in a frame, and the hinder part of the wheel is enclosed in a box or chamber. To the lower part of this chamber a share and mould-board are fixed. The share cuts away or loosens the earth for a subsequent operation, when the rotating shovels will raise the loose earth, and throw it on to wing pieces which are attached to the sides of the apparatus, and from which wings it will fall into carts, whereby it may be removed to any convenient place for deposit. The apparatus is to be drawn forward by horses, and the onward progress thereof causes the wheel with the shovels attached thereto to rotate and scoop up the earth that has been loosened by a previous operation."

[Printed, 4d. No Drawings.]

A.D. 1853, February 15.—No. 399.

FRANCIS, HENRY.—(*Provisional protection only.*)—"Instruments for cutting wool, hair, and vegetable matters."

Among the implements described is a cutter for reaping machines, &c. It is an "instrument of thin crimped steel forming a cutter by having the angular cut" (shown in the drawing) "given to it, and can be sharpened by one straightforward motion of a sharpening stone." "Cutters on this principle may be backed with iron, and set in any machinery intended to be worked over fields of grass, wheat, or other growing crops intended to be mowed or reaped thereby."

[Printed, 6d. Drawing.]

A.D. 1853, February 17.—No. 422.

FROST, ISAAC.—"Reaping or cutting crops."

Circular saws are used as cutters; they are fixed in a frame of the usual sort, and are driven from the bearing wheels which are spiked to give greater hold on the ground. In front of the saws there are "guiding angular instruments," "several to each saw, and between the back ends of these instruments the circular saws rotate." The edges of these fingers are preferably sharp. The cut crop falls on two circular tables, fitted side by side on a platform behind the cutters, and is by them carried to the side and deposited on the ground. A moveable guide is arranged to direct the crop to one or other side of the machine.

[Printed, 1s. 6d. Drawings.]

A.D. 1853, February 28.—No. 497.

VON GILGENHEIM, THEODORE, Baron.—(*Provisional protection only.*)—"A new machine, with its adjuncts or other apparatus, to be used for agricultural purposes." The chief part of this machine consists of a new disposition of spades or forks, held or retained by an axis working in a hollow cylinder made in a wheel. "An apparatus with rollers" is described, "which is to be fitted when needful behind the machine to pound the clods of earth, and to free them from any roots which they may contain." "A system of rollers" is also described, "over and around which pass chains sufficiently near each

“ other as to serve to hold the earth, which the principal  
 “ machine (placed in front) may deposit therein. The incessant  
 “ motion of these chains break or bruise the earth, and  
 “ disengage therefrom all weeds or fibres of plants, which are  
 “ immediately burnt by being passed over or into a furnace  
 “ which is below, and kept at a red heat by a ventilator.” An  
 apparatus for sowing seed may be used in conjunction with the  
 above-named machinery, in which case, of course, the use of  
 the furnace is to be dispensed with. “ A machine with one  
 “ wheel only ” is described as “ intended to be employed in  
 “ prairies, forests, or upon other land which is intersected by  
 “ quantities of roots or fibres, for the cleansing of trenches,  
 “ gutters, ditches, and other similar places.”

[Printed, 8d. Drawings.]

A.D. 1853, February 28.—No. 501.

BENTALL, EDWARD HAMMOND,—“ Harrows.”

The invention “ relates to an improved mode of making or  
 “ constructing the framework of harrows so as to obtain light-  
 “ ness as well as strength, and consists in making the said  
 “ framework of wrought angle iron instead of wood, or flat,  
 “ square, or round bars of wrought iron.” The bars and  
 beams of which the framework of the harrow is to be com-  
 posed consist simply of bars of iron either flanged or ribbed  
 in their section. These bars and beams are bent to the  
 required form, and holes are punched through them at  
 those places where the teeth are intended to be inserted.  
 The holes of the longitudinal and transverse bars having  
 being brought into coincidence, the bars and beams are  
 connected together by means of the teeth or tines of the  
 harrow, which may be fixed and secured in the holes by  
 means of nuts that are screwed on to their upper ends, or in  
 any other convenient manner.”

[Printed, 8d. Drawing.]

A.D. 1853, March 2.—No. 527.

MONZANI, WILLOUGHBY THEOBALD.—(*Provisional protection only.*)—“ Reaping machinery.”

The following is the whole Provisional Specification :—

“ This invention consists of giving motion to the cutter bar  
 “ by means of a disc having on either side inclined projections,



" each of which in succession gives a sudden motion to the  
 " cutter bar ; and in place of having the cutters all of the  
 " same form as heretofore, I cause them alternately to be of  
 " different forms, that is, some stand off at right angles to the  
 " cutter bar and others at an inclination thereto ; and in order  
 " to keep the cutters from choking I employ a bar or scraper,  
 " which moving outwards and back quickly removes any  
 " matters which may be between the cutters."

[Printed, *ad.* No Drawings.]

A.D. 1853, March 12.—No. 624.

BELLFORD, AUGUSTE EDOUARD LORADOUX. —(*A communication.*)—"Cutting standing crops, and gathering the same  
 " into sheaves."

1. The cutters are formed with projecting ribs to clear the  
 fingers from clogging matter.

2. The cut crop is received on an endless travelling web,  
 which receives an intermittent motion by its driving belt being  
 moved to and from fast and loose pulleys by an eccentric and  
 lever. The object of this is to allow sufficient for a sheaf to  
 collect and be carried back at once

3. The crop is delivered by the apron to a pair of hooks  
 which open and close so as to hold the sheaf to be tied and  
 then release it. This motion is given the hooks by a pair of  
 reciprocating bars, which carry the ends of their stems back-  
 wards and forwards, the stems being pivotted to a bar above  
 the reciprocating bars. More than a single pair of hooks may  
 be employed.

[Printed, *ad.* Drawings.]

A.D. 1853, March 29.—No. 752.

HENHAM, WILLIAM. —(*Provisional protection only.*)—  
 " Ploughs."

The whole Provisional Specification is as follows :—

" I crank both arms of the axle, and fix the wheels on the  
 " cranks so that the plough may remain as nearly upright as  
 " may be when at work, and when one wheel is in a furrow and  
 " the other on level ground. In turn rest ploughs I crank the  
 " shaft of the coulter or the coulter itself, and make it to cut  
 " both at front and back. It may be turned round in the  
 " beam of the plough, and work on whichever side thereof  
 " required."

[Printed, *ad.* No Drawings.]

A. D. 1853, April 5.—No. 815.

FLANDERS, SMITH. —(*Provisional protection only.*)—"Construction of ploughs."

These consist, first, in the application of "a share revolving horizontally upon a vertical bolt or pin, so as to form an oblique or angular share of any inclination that may be required;" also in the use of a chap, made in two parts bolted together to receive the horizontal revolving share.

Secondly, in the use of a necked revolving coulter stem, which passes through the beam of the plough, and is so formed as to receive a coulter blade.

Thirdly, in an apparatus for giving motion to the share, coulter and breasts of ploughs, wherein two short levers or reins attached to the arm of an upper set collar on the coulter stem, are connected by rods to a cross or T-headed lever, which works the share and wrests or breasts; the coulter is "made fast to the top of a spindle that passes through the beam of the plough, and through the upper part of the chap, the lower end of the said spindle being formed into a crank, which crank works between the two parts of the chap actuating the share lever, which share lever causes the share to revolve in a horizontal position; and in conjunction with the spindle" the inventor says, "I employ a connecting link by which to work the wrests or breasts."

Fourthly, in the use of a slicer or cutter with one or two blades for paring the grass off the edge of the furrow, the stem of which slicer passes through the beam of the plough, and is capable of adjustment.

"Finally," the inventor says, "all the above improvements in the construction of ploughs, whether applied to swing ploughs, foot ploughs, or wheel ploughs, or whether used separately or connectively I claim as the original inventor."

[Printed, 4d. No Drawings.]

A. D 1853, April 20.—No. 954.

FOSTER, THOMAS COOKE.—(*Provisional protection only.*)—"Reaping machine."

The following is the whole Provisional Specification:—

"It consists chiefly of two parts, a cutting and receiving portion. The cutting is effected by means of a cylinder

" placed near the ground transversely in front of the machine,  
 " and provided with a series of longitudinal blades, so centred  
 " as to fall at a convenient angle for mowing and cutting in  
 " front of the machine, while the remainder of the said blades  
 " round the remainder of the circumference remain shut up  
 " perfectly close to the surface. The blades can be slightly  
 " inclined longitudinally or curved, and the number will vary  
 " according to the size of the cylinder. Motion is communi-  
 " cated to the cylinder and blades from the main shaft of the  
 " machine by traction. The blades may be made to open  
 " either by their own gravity or by means of springs. The  
 " receiving portion of the machine is partly curved in section  
 " to allow of the gathering of the corn into sheaves, and a  
 " trap is appended which drops the sheaves when collected.  
 " The principal improvements are the transverse cutters  
 " placed round the periphery of a cylinder."

[Printed, 4d. No Drawings.]

A.D. 1853, April 20.—No. 956.

BROOMAN, RICHARD ARCHIBALD. — (*A communication.*) —

" Reaping and gathering machinery."

The invention consists in "the adaptation of the common  
 " grain cradles to machinery." A carriage drawn by a horse  
 at one side in front of the apparatus gives motion from its bear-  
 ing wheels to the cutters and "cradles." A disc with a sharp  
 cutting edge has secured thereon curved blades projecting be-  
 yond the edge and set so that the angle between the blade and  
 the edge of the disc is a very small one. Above this disc and  
 moving therewith are "curved fingers as in the ordinary hand  
 " cradle," forming a sort of frame which supports the corn, &c.  
 These "convey what is cut to the inside" or centre of the disc  
 " where a man stands" on a platform over the disc, "ready to  
 " throw it out to the rear part of the cart, where it can be  
 " bound, and either thrown on to the ground, or conveyed to  
 " the outskirts of the field." There are projecting pieces in  
 front of the cutters, which serve to raise the corn. They are  
 formed underneath like sledge runners, and also serve to pre-  
 vent stones, &c. getting into the cutters. To determine the  
 height of the stubble, the body of the apparatus can be raised  
 and lowered.

[Printed, 1s. Drawings.]

A.D. 1853, April 21.—No. 967.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—"Ma-  
" chinery for bending wood or other materials."

A machine is described for bending wood, &c. into various shapes. Among the articles that may be thus formed are mentioned plough handles.

The timber is placed in the machine "to which is adapted a  
" lever with a mould of the form required, and over which  
" mould the timber or other material is to be bent by means  
" of the lever. The lever to which the mould is attached  
" turns on a pin or stud, whereby it is connected to the main  
" framing of the machine. This lever must be lifted up when  
" the timber or material to be bent is placed in the machine ;  
" and to the inner end of the lever is attached a chain or  
" flexible metal plate or bar which supports the back of the  
" wood or material to be bent ; and this latter having been  
" properly secured in its place in the machine the mould lever  
" is to be brought down, and by means of the chain or flexible  
" bar behind will bring down the wood and hold it tightly  
" against the mould, where it must be retained until the ten-  
" dency of the wood to return to its natural form has been  
" overcome."

[Printed, &c. Drawings.]

A.D. 1853, April 25.—No. 991.

DAVIES, ROBERT.—(*Provisional protection only.*)—"Reap-  
" ing machine."

The following is the whole Provisional Specification :—

"To consist of two large wheels with axle-tree, and two large  
" drums to be fixed on the axle-tree, and two smaller drums,  
" with two wheels, fixed in the centre of each drum, and two  
" crown wheels, and two shafts, with cross bars fixed upon each  
" end ; and two round knives, with a box to be fitted at the  
" back on the wood framework, and a wooden frame with sides  
" for the machinery to be fixed to, with two large leather straps  
" to work the drum wheels."

[Printed, &c. No Drawings.]

A.D. 1853, April 27.—No. 1006.

UNDERHAY, FREDERICK GEORGE.—"Reaping and mowing  
" machines."

The cutters consist of blades fixed to a pair of radial arms revolving on a vertical spindle. These, as they are revolved by gearing from the running wheels of the apparatus, cut the crop, which is received by one of a pair of basket-work "wings" carried on arms from the same spindle as the cutter arms. These "wings" convey the crop to a fixed platform over the cutters, and thence to a sliding floor which reciprocates backwards and forwards to receive the crop and deliver it at the back. On the arms carrying the "wings" are cams working on inclines round the spindle, and by them the wings "are caused to move forward at their lower ends, and thus to act on the cut crop, and to move it on the platform, and from the platform on to the floor."

[Printed, 10d. Drawings.]

A.D. 1853, April 28.—No. 1036.

REVIS, THOMAS. — "Single seed drilling or dibbling machinery."

A hand dibble for depositing seeds singly, one at a time, is described. It consists of two half tubes fitted together so as to be capable of sliding one upon the other. At top there is a funnel, and at the bottom of this there are two plates, one fitted to the top of each tube, so that when the tubes slide, a single seed is allowed to pass into the tube. By a similar movement the seed is deposited from the point of the dibble. A handle is affixed to one tube, by which the implement is forced into the soil, and a second handle on the second tube, by which it is raised a little and caused to slide on the other as above. A catch may be added to this handle, to prevent the tubes sliding until the proper moment. A similar arrangement may be applied to machine drills.

Reference is made to No. 689, A.D. 1852.

[Printed, 8d. Drawings.]

A.D. 1853, April 29.—No. 1048.

KEALY, JOHN. — "Machinery for mowing."

Two modifications of the apparatus are described, one to be driven by horse power, and the other by hand for mowing lawns, &c. In the former two rotating frames, driven from the running wheels, are arranged side by side in front of the mowing wheels, each carrying two sickle-shaped knives which act against

a fixed segmental cutting plate. A "rake or shakers" "may be attached to the hinder part of the machine, for the purpose of turning over the mown produce, or raking it into "ridges." There is a guide wheel in front of the apparatus just behind the cutters, and this can be turned to guide the machine by means of a lever extending to the back. The height of the cutters above the ground can also be regulated by raising or lowering the frame on the stem of this wheel. The horse can be harnessed behind the machine or in front at one side.

The smaller machine has a double reciprocating knife acting as above, instead of rotating knives. This can be driven from the running wheels or by a winch handle.

[Printed, 1s. Drawings.]

A.D. 1853, May 2.—No. 1058.

KINGSTON, JOHN FILMORE. — "Reaping and mowing machinery."

The cutter consists of a large ring set horizontally in a frame carried by two bearing wheels behind and one in front, this front wheel working in the centre of the cutter ring, which is supported by curved arms bent down from a central vertical spindle above driven from the hind running wheels. There is a "cradle" of "thin sheet iron or canvass supported by rods" on the cutter wheel, just within the cutter edge. There is also a "vertical roller, which by its revolution tends to move the "cut crop off to one side of the machine." This does not appear to be further described. For green crops "both surfaces" of the cutter may be smooth, but for straw crops "the "under surface should be ribbed or serrated."

[Printed, 1s. Drawings.]

A.D. 1853, May 4.—No. 1084.

BELL, GEORGE. — "A new machine for several agricultural "purposes," viz., manuring, sowing, drilling, harrowing, and rolling. On the upper part of a portable frame, "supported "on a roller, or one or more wheels in front and a roller "behind," and furnished with drawing shafts, and also with "a set of coulters and pipes, for depositing the manure and "grain, with an instrument behind them for filling in the "ruts," is fitted, firstly, a manure hopper, wherein "agitators," "fixed to a shaft which is moved slowly backwards and



" forwards by means of a crank or other suitable arrangement," cause the manure to pass down upon a number of fluted rollers, mounted on a horizontal shaft, which derives motion, by means of pulleys and a band, from the travelling wheels or roller, whence the manure passes to the delivery spouts; "the quantity of manure allowed thus to fall" being "regulated by apparatus consisting of a main shaft, to which are connected a number of cranked levers (one to each fluted roller), by the moving of which shaft in a horizontal direction, by means of a screw at its end, the whole shutters are worked vertically."

Secondly, the grain hopper, which "is similar to the foregoing, and has rollers in it; only that instead of being fluted on their whole length, they are plain at the ends. It has the same apparatus for regulating the quantity of grain distributed, but not the agitators."

Thirdly, the grass-seed hopper, which contains "circular brushes, in a horizontal shaft," with apertures beneath the brushes, and a shifting plate for regulating the delivery of seed.

"Beneath these hoppers are mounted, on the underneath part of the portable frame, a set of Norwegian harrows."

"When required, boxes for sowing turnip seeds are substituted for the grass seed hopper, such boxes being fixed on a separate shaft, and furnished with suitable coulters and pipes for depositing the seed; the regulation of which is effected by handles and levers acting upon suitable slides or shutters."

The inventor does not confine himself to the precise forms of the parts described, nor does he claim any of those parts separately, but, he says, "what I do claim as my invention is the general combination and arrangement of the parts constituting a machine in which the foregoing operations may be successively performed as described."

[Printed, *ad.* No Drawings.]

A.D. 1853, May 6.—No. 1113.

MURRAY, THOMAS.—(*Provisional protection only.*)—"Implement for hoeing, cutting, and otherwise operating upon turnips," &c.

Motion is conveyed from the axle of the bearing wheels of a carriage by suitable gearing to a crank shaft. Thence motion

is given to a pair of "slide rods." "Attached to these slide rods, which are horizontal) are guide boxes, through which pass vertical rods each carrying at its lower end the hoe or other instrument" to be actuated. "These vertical rods work up and down against small friction rollers in the guide boxes, and they have a compound motion imparted to them by means of a lever turning on a fixed centre" so that the hoe, &c. "is made to move over the arc of a circle." The apparatus may also be modified to render it available for cutting turnips, &c. ; "and the machine may have applied to it any agricultural instrument which may be made to produce useful effects by having the above-described motion or motions imparted to it."

[Printed, 4d. No Drawings.]

A.D. 1853, May 10.—No. 1151.

**JOHNSON, JOHN HENRY.**—(*A communication.*)—The invention relates to an implement "to be used for digging, pulverising, levelling, or drilling and rolling the soil, the sowing of seeds, and the depositing of manure," and also to "an improved mechanical apparatus for reaping and mowing." The machine consists of a box cart, mounted upon running wheels, in front of the axle of which is placed "an upright tubular boiler and engine," whilst from the same axle is suspended a framework, which extends behind the cart box, and has suspended to its extremities "a revolving cylinder, into which are affixed a series of steel pointed picks, spades, or knives; the framework is supported by a platform attached to the axle of the cart, and arranged on two wheels," "either in the same plane or in a different plane with the large running wheels," and rolling immediately in front of the cutting cylinder." "An apparatus or screw is attached to the platform for raising and depressing the whole framework and cutting cylinder to any required gauge; the cutting cylinder derives its motion from the steam engine, the gearing being attached to the axle of the cart, the whole being suspended from one common centre." The attachment of the gear to the cart axle is effected by means of a tubular shaft, revolving loosely thereon, when actuated, through the medium of pulleys and a belt, by a rod, "connected to the piston rod of the vertical inverted steam cylinder."

Horse or other separate power, "having no connection whatever with the cutting apparatus," is to be used for drawing the machine over the ground, although "by a very slight modification in the mechanism, and the addition of another engine, the large pair of running wheels" "may be driven by the steam engine itself, thus making the implement a locomotive machine." "Immediately behind, over the cutting cylinder and at the end of the framework, is attached a box, behind which is affixed a roller giving motion to a brush seed sower," or manure distributor, "arranged in the box, which acts as a leveller to the pulverized earth." The machine can "be adapted to purposes of draining by reducing the length of the cylinder, the apparatus being so arranged as to admit of its cutting to any required depth. To the machine, by the removal of the pulverizing and draining apparatus, may be attached a reaping or mowing platform, and the horses reversed in the shafts to bring their heads in the direction of the cart," so that, as the machine is pushed forward, the grain is cut by revolving blades, and falls into a series of receiving arms, which are kept closed by flat blade springs, but which can be opened when full to allow the sheaf to fall on to the platform; a slightly modified arrangement is applicable to the purpose of grass mowing. "The cart containing the motive power, with the boiler and engine, may be applied to general farm purposes, such as thrashing, cleaning grain, cutting wood, pumping water, &c." Another modification of the cart and actuating mechanism is described, the length of the cart, as well as that of the moveable framing, supported by the axle of the large running wheels, and carrying the axle of the small running wheels, is reduced, and an arrangement is provided whereby the said frame together with the small wheels can be elevated, and the whole weight of the machine thrown on to the large wheels, thereby facilitating the turning of the machine at the headlands.

[Printed, 1s. 2d. Drawings.]

A.D. 1853, May 11.—No. 1158.

**MAZIER, MARIE PIERRE FERDINAND.**—"Machine for cutting and reaping corn, corn crops, and other plants."

The apparatus is in two parts, a frame mounted on running wheels, and a second frame carrying the cutters, which is

attached to the hinder portion of the first frame so as to project at one side; it is so connected that it is capable of being set at either side of the machine, or of being turned up out of the way when not in use. The cutter consists of a vibrating saw acting between fingers. Behind it is a platform which slides on the ground and is cleared by hand as it fills; it has also a "sliding motion backwards and forwards to carry the corn from the cutters, and to lay it in sheaves on the ground." Over the cutters is "a fan wheel of the ordinary description" for carrying the corn backwards. A roller is attached to the machine so as to project over the portion of the crop to be cut at the next traverse of the machine, and it "lays the crop to the former angle to be cut most advantageously on the return of the machine."

[Printed, ed. Drawing.]

A.D. 1853, May 27.—No. 1303.

HENHAM, WILLIAM.—Ploughs.

1. The axle of the fore carriage is cranked, so as to "maintain the perpendicular or nearly perpendicular position of the ordinary standards when the wheels are travelling over ground at different levels." When the frame is of wood the axle is passed through a stock of wood and cranked so that one wheel may be fixed and turn at a higher level than the other. By this means the axle may be maintained in a horizontal or nearly horizontal position which enables the plough to be kept upright. This cranked axle may also be applied to a plough with an iron frame."

2. The coulter is cranked "so that it may be turned so as to cut on either edge without altering its vertical position."

3. The "turn-wrests" are so formed that the lower "wrest" shall, after operating upon the furrow for a short distance, cease to operate, being cranked inwards, and leave the upper wrest to act upon and turn the furrow; the lower wrest being again cranked outwards near its outer end is again brought into operation upon the furrow."

[Printed, ed. Drawing.]

A.D. 1853, May 28.—No. 1314.

HARRIOTT, GEORGE.—"Agricultural implements used in crushing and rolling land."

A roller is described, formed of several cylinders on an axle, the cylinders having each a set of helical threads on it. They may be either hollow or solid. The end of the axle on each side runs in a box which slides in vertical guides, and has a helical spring between it and the top of the frame to allow for inequalities in the ground. The frame can be lifted off. The roller may be used for clod-crushing, rolling land or grass, &c., and after sowing, as well as for other purposes.

[Printed, 6d. Drawing.]

A. D. 1853, June 1.—No. 1347.

DUNDONALD, Admiral the Earl of.—"Apparatus for laying pipes in the earth," &c.

The apparatus consists of a carriage or beam "having a coulter or cutter for vertically parting the earth, and a horizontal tool attached thereto, similar to that of a drain plough," whereby a channel is formed for the reception of the pipes, which descend through an inclined passage from the upper and foremost part of the carriage, and are continuously deposited in the channel, the pipes being connected for this purpose by a rope, which is preferred to be elastic.

The second part of the invention relates to forming one end of each pipe with a concentric knob, which fits into a cup or circular segment on the end of the next pipe, in the manner of a ball-and-socket joint.

[Printed, 6d. Drawing.]

A. D. 1853, June 2.—No. 1349.

WHITWORTH, JOSEPH.—(*Provisional protection only.*)—"Machinery for cutting and harvesting corn, grass, and other crops."

1. The cut crop is received on an endless belt, stretched over three drums, of which the one nearest the standing crop is lower than the other two. The belt is fitted with hooks thereon, and has an intermittent motion, so that sufficient corn, &c. is allowed to collect to form a sheaf, which is then carried off by the movement of the belt.

2. Improvements on No. 12,007, A. D. 1849. Two or more revolving cutters are used instead of one, and an improved method (not described), is employed for adjusting and driving them.

3. Machine for collecting hay or grass into swathes. A frame "set obliquely to the forward motion of the machines, " and at an angle to the surface of the ground," is mounted on a pair of wheels. The frame carries two endless bands over rollers, and on these bands parallel boards or racks are mounted. "The frame radiates from the axle of the top roller, and adjusts itself to the inequalities of the ground." The rollers are driven by gearing from the running wheels.

4. For loading hay, a frame mounted on a pair of wheels carries an endless band over rollers. Rakes on the band draw the hay up an inclined plane, and deposit it in a suitable receptacle which "is made to revolve slowly, so that the hay " may be equally distributed within it." When full, the receptacle may be emptied on to the stack. Or the apparatus may deliver direct into a cart.

[Printed, 4*l*. No Drawings.]

A.D. 1853, June 3.—No. 1365.

WILSON, JAMES SPOTSWOOD. This machine, which the inventor calls a "cycloidal digging and ploughing machine," is "applicable to agricultural and engineering purposes," and may either be driven by animal or steam power. The working parts are affixed to side levers, supported at their front end by a bar attached to the framework, which is carried by travelling wheels, and at their back end by a screw, whereby they can be adjusted vertically, and when required, lifted above the ground; these objects, however, may be effected by other mechanical contrivances. The invention consists, firstly, in placing a number of wheels or cylinders, so as to turn freely and independently, on an axle, "each cylinder being furnished " at equal distance round its circumference, with curved pick-shaped prongs"; such prongs, spades, or picks being so curved that "each point where it comes in contact with the " ground represents a segment of the curve which a point on " the periphery of the wheel would describe at each revolution " while travelling over the ground, in consequence of which " the pick-shaped digging points receive the direct pressure " of the wheel throughout their length."

Secondly, in so arranging angular mould-boards, "one in " each space between the digging wheels," as to receive and turn over the soil, raised by, and falling from, the digging



points; scrapers being arranged between the digging points to prevent any of the earth being carried over.

Thirdly, in placing circular revolving coulters, either in advance of, or on the same axle and wheels as the digging prongs, for the purpose of cutting the surface of the land into breadths corresponding to the distance between each set of digging points.

[Printed, 8d. Drawing.]

A. D. 1853, June 9.—No. 1409.

ARNOUX, CLAUDE. — "New system of towing and traction."

The following is all the description given :—

"The invention consists in the mode of employing ropes or chains and pulleys for towing boats, the traction of locomotives, or railway carriages on railways, for working ploughs, and other similar purposes.

"When applied to driving boats on canals or rivers, the cord or chain is set down the whole length of the distance to be travelled over, and is suitably fastened at its extremities in the bed of the river, or on one side of the navigable way at the bow. The pulleys are placed on a vessel preceding those to be towed, and on this vessel a steam engine is set up, which serves to give motion to the said pulleys; and the pulleys moving in an opposite direction to that the boat is intended to follow, will cause it to go forward. The grooves of the pulleys are of the same form as the links of the chain or the torsions of the rope, and will hold the rope or chain tightly, so as to prevent its slipping. The same contrivance may be applied to railroads for enabling the locomotive and carriages to surmount risings. It may also be applied for working ploughs when steam power is employed, and procures the advantages of a fixed point, which renders the action of the plough more perfect."

[Printed, 4d. No Drawings.]

A. D. 1853, June 13.—No. 1426.

O'CONNOR, HENRY. — (*Provisional protection only.*) —

The invention relates to "digging the soil by machinery with horse power," and consists of a frame, mounted upon two travelling wheels, one of which is fixed, whilst the other runs

loose, upon an axle, to which, however, the latter wheel can be occasionally fixed by a coupling. Motion is communicated, through the medium of toothed gear, from a toothed wheel on the axle of the travelling wheels, to a shaft with four cranks, to which "are fixed the ends of four iron spades, which by the revolution of the cranks are alternately raised and depressed, and at the same time receive a lifting motion by being passed thro' grooves at the end of the framing. The crank shaft can be lifted by means of a lever or handle when it is desired to keep the spades from working."

[Printed, sd. Drawings.]

A.D. 1853, June 15.—No. 1446.

BUTTERWORTH, THOMAS.—"Machine for ploughing land, harrowing, and crushing clods at one operation."

The machine is carried by an ordinary plough frame. A mould board has in front of it a share. Under it are two "rising blades or flanges," one from the point and the other from the back of the share to the back of the mould board. In front of the mould board is a roller mounted on levers, so as to rest freely on the ground. The soil as it is turned up by the share is crushed by the roller. On the mould board, on its upper side, a number of harrow teeth are fixed which treat the soil after the roller has passed over it and take out the weeds, the teeth being inclined backwards at an angle so as to leave the weeds on the surface.

[Printed, 6d. Drawing.]

. A.D. 1853, June 16.—No. 1472.

WARREN, JOSEPH.—Ploughs.

"This invention consists of a combination of apparatus applied to a plough for the purpose of varying the depths and positions of parts thereof. The sole and shear are connected at their fore ends to a cranked lever which moves on an axis fixed to the beam of the plough, and the back end of the cranked lever is connected by a link to a hand lever moving on an axis on the handle at the back end of the beam, by which means the cranked lever can be raised and lowered, and set fast in any desired position by a set screw. The back end of the mould board is attached by

" a stay to the sole and to the beam, and there is a socket  
 " fixed to the sole for guiding the cranked lever in its move-  
 " ment up and down."

[Printed, &c. Drawing.]

A.D. 1853, June 17.—No. 1479.

BLEASDALE, HENRY, and BLEASDALE, JOSEPH. — "Work-  
 " ing, tilling or preparing land."

A frame mounted on a pair of running wheels carries, near the ground, a transverse shaft set with curved digger arms which "cut into the earth as the machine travels forward." Parallel with this shaft but behind and above it is a second shaft carrying curved clearing arms or forks, and geared to the first so as to rotate in an opposite direction to it and at a greater speed. By these the weeds are cleared off the digging arms. The frame in which the digging apparatus is set can be raised at one end by means of a segmental rack and pinion, driven by a worm and worm-wheel, so as to lift the diggers clear of the ground.

[Printed, &c. Drawing.]

A.D. 1853, June 21.—No. 1518.

DRUMMOND, JOHN. — (*Provisional protection only.*) —  
 " Reaping machine."

The following is the whole Provisional Specification:—

" My invention consists of a simple framework, mounted on  
 " two wheels, similar to a single horse cart, with the exception  
 " that the axle is made moveable with the wheels. An upright  
 " or vertical shaft is attached to the back or hindermost part  
 " of the framework to which the cutter or cutters are attached  
 " with a moveable joint and pin, so as to enable it to be  
 " adapted to every kind of surface, and thus cut the crop at  
 " any height found necessary. Motion is communicated to  
 " the shaft and cutters from the axle and driving wheels.  
 " There is a guard or pointed mould or soil board (similar in  
 " its effect to the 'mould board' of a plough) attached to the  
 " framework, extending over the driving wheels and against  
 " the crops. The object of this board is to gather the corn  
 " and get it upright and hold it whilst being cut & press it  
 " over against the standing corn into a position in which it is  
 " to be until bound into sheaves. A friction roller or wheel

" is attached to the front joint or fore part of the guard or  
 " mould board to conduct it over the ground. This part of  
 " the mould board is only attached and employed when the  
 " corn is very much laid or beaten down. When the crop is  
 " but partially laid the fore part of the mould board is taken  
 " off and dispensed with."

[Printed, &c. No Drawings.]

A. D. 1853, June 22.—No. 1523.

HUCKVALE, FRANCIS. "Hand hoes."

The handle is forked at its lower end and each limb of the fork has a blade affixed thereto. Each blade has a short stem, preferably placed nearer one end of the blade than the other. This stem is secured in a socket in the handle by a set screw or otherwise, so that the angle of the blades can be varied, and they can be set with their longer portion either outwards "to hoe at the same time on either side of a row of turnips or other plants," or inwards "for hoeing between two rows of plants."

[Printed, 10*l*. Drawings.]

A. D. 1853, June 29.—No. 1567.

PATTERSON, JOHN. — (*Letters Patent void for want of Final Specification.*)—"Machines for reaping and mowing corn, grass, and other crops."

The fingers are fastened alternately above and below a thin bar, fixed across the front of the machine. The cutter is a thin blade, with a serrated edge, and it lies along the finger-bar between the fingers; it is of the same thickness as the finger-bar, so as to work against the fingers above and below. It is affixed to levers at each side, and the other ends of the levers are connected by a tension rod, by tightening which the cutter can also be tightened. Reciprocating motion is given to the cutter from a single running wheel which supports the frame; the cutter, &c. is hinged to the frame, and the motion is transmitted through a bar passing through the centre of the hinge. The front part of the cutting apparatus rests on a slide at each side, and the height of these slides can be regulated by screws, so as to raise or lower the cutter. There is a gatherer to carry the corn back over the cutters. Behind and above the cutter is a transverse bar or roller, and sloping upwards from this is a frame with endless bands fitted with

tines working across the machine so as to carry the cut crop to the side and deliver it there. Projecting backwards from the machine is a draught pole, with a cross bar at the end, to which the horses are harnessed. This cross bar has a wheel at each end. The pole is pivotted to the frame of the machine, and by means of a toothed quadrant and a pinion, the apparatus may be guided.

[Printed, &c. Drawings.]

A. D. 1853, June 30.—No. 1581.

SPOONER, WILLIAM CHARLES.—The improvements “relate  
“ to the distribution of liquid into the soil in drills or rows  
“ at the period of sowing by means of the gravity of the  
“ liquid, and through pipes, and to the combination there-  
“ with of a seed box and manure drill.” “The complete  
“ machine consists of a seed box, from which seeds are taken  
“ up by means of cups in the ordinary way, and delivered  
“ into pipes or cans which pass into the soil; a manure box  
“ divided into as many divisions as there are coulters, the  
“ manure being discharged from the lower part of each  
“ compartment by fluted rollers or other suitable means,”  
and delivered into the said pipes or cans; a water chamber  
or tank, “which is divided into compartments corresponding  
“ to the number of coulters in the drill, which compartments  
“ may or may not be formed so as to communicate with each  
“ other” and whence the water passes through a series of  
cocks, fitted to the bottom of the tank, into the said pipes  
or cans. A series of valves, each of which is kept shut by  
a blade spring, serve to shut off communication between the  
several compartments in the water tank; all the valves,  
however, can be opened simultaneously by means of a  
transverse rod, formed with a handle at the outside of the  
cart. To the plugs of the cocks at the bottom of the tank  
are fitted spur pinions, which gear with similar pinions on a  
transverse shaft, whereby, through the medium of a lever and  
rod, the whole of the cocks may be opened or shut; such  
opening or shutting movement being transmitted to an index  
by means of a pair of bevil wheels and a spindle. “The  
“ water tank may be used either in conjunction with a seed  
“ drill alone, or with a manure distributor, or simply as a  
“ water cart.”

[Printed, &c. Drawing.]

A.D. 1853, June 30.—No. 1582.

**TASKER, WILLIAM.**—“Drills for agricultural purposes.”

An apparatus for distributing manure is described. The manure is contained in a box divided into compartments corresponding with the number of coulters, and having within it revolving agitators. Below this is a transverse fixed cylinder round which a “fluted cylinder,” or as it appears to be described in another part of the Specification, a cylinder formed of bars with open spaces between, revolves. This discharges the manure into spouts leading to the drills. There is also a seed distributing apparatus with revolving cups of the usual sort. All the moving parts are actuated by gearing from the running wheels, which can be thrown out of gear when required.

[Printed, &c. Drawings.]

A.D. 1853, July 15.—No. 1697.

**NEWTON, WILLIAM EDWARD.**—(*A communication.*) —  
“Apparatus for digging, excavating, and removing earth.”

The machine “although applicable for digging, excavating, and removing earth for various purposes, is intended more particularly for digging or cutting drains or ditches, and removing the earth therefrom.” It consists “principally of a rotating wheel, to which a number of shovels are attached. This wheel is mounted in a frame; and the hinder part of the wheel is enclosed in a box or chamber. To the lower part of this chamber, or to some convenient part of the frame-work, a share and mould board are fixed; and as the machine is propelled or drawn forward, the share cuts away or loosens the earth for a subsequent operation, when the rotating shovels will raise the loose earth and throw it on to wing pieces, which are attached to the sides of the apparatus.”

From these wing pieces the earth may fall into a cart, barrow, or other receptacle, or on to the ground alongside of the drain. A shaft, armed with spikes or teeth, is mounted at the upper part of the framing, for the purpose of clearing the shovels from earth. The apparatus is mounted on running wheels and drawn by horses. “The onward progress thereof causes the wheel with the shovels attached thereto to rotate



" and scrape up the earth that has been loosened by a previous operation." A counter may be fixed in front of the excavating wheel. The running wheels may sometimes be dispensed with. Sometimes two "digging wheels" may be mounted side by side in one case.

(Patent of No Drawings.)

A. D. 1853, August 1. No. 1787.

CADELL, HENRY.—(*Provisional protection only.*)—"Reaping machine."

The following is the whole Provisional Specification:—

" My invention consists in the use of a machine in which  
 " a series of cutters or scythes of a crescent shape are attached  
 " to a cylindrical frame or drum which is made to revolve  
 " with the cutters, such cutters in front passing or working  
 " over a set of fixed teeth or cutters of a diamond pointed shape  
 " attached to the under frame of the machine. Each moving  
 " cutter is surmounted by a rake of two or more prongs,  
 " which is hung upon pivots attached to the side of the drum.  
 " This rake, by means of a spanner acting upon a cam fixed  
 " to the upper frame of the machine, is made to stand out, and  
 " receive the corn or other agricultural produce in front as it  
 " is cut, and carry it to one side of the machine, whence the  
 " rake is made to fall back by means of a recess in the cam  
 " and to discharge the corn. The machine is driven by  
 " horses by means of a pole behind, the motion for giving  
 " revolution to the drum with its cutters and rakes being  
 " taken from one of the two principal wheels on which the  
 " machine travels, such motion acting with the progression of  
 " the machine."

(Patent of No Drawings.)

A. D. 1853, August 1.—No. 1792.

TRACY, JAMES PUDNEY, and TRACY, JOHN HART. (*Provisional protection only.*)—"Cutting, reaping, and gathering machines."

The machine " consists of a frame depending from an axle  
 " supported by two main wheels. The cutter consists of  
 " a series of segments of circles serrated at their edges, and  
 " bolted or fixed all round the circumference of a wheel  
 " placed horizontally in front of the main supporting wheels."

The cutter is driven by a band from a drum actuated by bevel gearing from the axle. "The gatherer consists of two, " three, or more horizontal wheels, which are placed over " the cutter wheel, and the spokes of which project beyond " the front and part of the sides of the frame. A semi-circular " finger plate is bolted to the framework, immediately over " the cutter wheel." The fore-part of the machine can be raised or lowered by a lever "whose fulcrum is in a standard " rising from the bottom frame of the machine." "On the " axle are two bevel wheels, and the chain wheel or drum " can be made to gear into either of these so as to cause the " cutter to rotate from left to right, or *vice versa*." When moving along a road the chain wheel or drum can be put out of gear with both bevel wheels. The machine may be drawn by horses from the side or pushed by horses harnessed behind.

[Printed, &c. No Drawings.]

A.D. 1853, August 1.—No. 1799.

VAILE, HENRY PURSER.—(*Provisional protection only*).—"Reaping machinery."

The following is the whole Provisional Specification:—

"This invention consists of applying a series of circular " rotatory cutters, by preference with serrated edges, in such " manner that they rotate in different planes, and so as to " overlap each other; these cutters act independently of " each other, and are driven by bands or suitable gear- " ing; and in order to guide the crop up to the cutters " fixed projections or fingers are used forward of the cutters. " The frame which carries these cutters is made to rise and " fall to accommodate for the inequalities of the land. The " crop as it is cut is moved to one side by an endless band. " Motion is communicated to the several parts by gearing " from the main wheel or axle of the carriage."

[Printed, &c. No Drawings.]

A.D. 1853, August 3.—No. 1810.

ATKINS, THOMAS.—(*Provisional protection only*).—"Im- " provements in transmitting power and communicating motion " to agricultural implements."

The following is the whole Provisional Specification:—

"The transmission of power, whether derived from water, wind, steam, heated air, or other source for communicating motion to agricultural implements, is this:—I surround a grooved wheel, which will be in connection with the prime mover, with a rope or cord, whether of metal, hemp, or other elastic material, termed an endless cord, and secure such rope or cord at a proper tension to enable me to transmit power. I attach the same at the requisite distance to a frame termed by me a rope-cart or carrier, such rope-cart being provided with pulleys, wheels, and mechanism to secure a steady strain for keeping the rope at a proper tension to enable me to transmit or communicate power to a carriage, which I term a 'communicator,' either to work horizontally or perpendicularly. This is a method of communicating power from a stationary or locomotive prime mover, or both, to locomotive implements for cultivating, sowing, reaping, mowing, dressing, ploughing, or other work required in agricultural business. Attached as circumstances may require, I used a cylinder of any required diameter, with one or smaller ones attached as may be requisite, such cylinders to be set or studded with spades, knives, or prongs, or such other teeth or implements as the circumstances of the case may require."

[Printed, &c. No Drawings.]

A.D. 1853, August 6.—No. 1842.

SOUTHAN, HENRY.—(*Provisional protection only.*)—The invention relates to "improvements in ploughs," and consists "in forming that portion of a plough known as the 'sock' or share (and which is situated immediately in front of the 'mould board') in the form of a screw, having any sufficient number of blades or 'worms,' which blades may be of any desirable pitch to suit the soil through which they are to work." The blades may be made "of such a size and pitch that a mould board will be unnecessary, as in the progress of the screw the blades will sufficiently throw over the soil." "That part termed the 'beam'" is made "more curved than in ordinary ploughs. This plough may be driven by either steam or horse power."

[Printed, &c. No Drawings.]

A.D. 1858, August 18.—No. 1899.

**HOSKYN, CHANDOS WHEE.**—"Application of steam to cultivation."

"This invention consists of a machine for the cultivation of the soil, more especially clay soils, by steam power, applied in such a manner as to accomplish at one process the due preparation of the soil for a seed bed." The machine "is so applied to the soil as to reduce it by abrasion to the required tilth or fineness. This abrasion is performed by a series of discs or wheels, fixed on a rotating axis actuated by steam power—the periphery of which discs are furnished with radiating points or cutters. The rotatory motion of the discs is communicated from the steam engine, from which also the progressive motion of the machine is derived. The two motions are independent of each other, and so arranged that a rapid motion may be given to the cutters while the progressive motion is slow or suspended altogether, as at commencing. The gearing is such that the respective speeds can be varied at pleasure to suit the nature of the soil. The cutters by their rotary action first enter the soil, making a semicircular trench, which during the progress of the machine is constantly preserved at the required depth; and the soil, abraded and cut down as the machine advances, is thrown off tangentially behind, and deposited in a comminuted, inverted, and aerated condition." The machine is mounted on two pair of very broad wheels or rollers, the driving wheels or rollers being made with ribs across the periphery, to ensure a sufficient bite or hold upon the ground.

[Printed, 1864. Drawings.]

A.D. 1853, August 18.—No. 1931.

**HARKES, DAVID.**—"Apparatus for mowing, reaping, or other similar purposes."

A drum is mounted on a short vertical shaft below a frame to which the draught gear is attached. Within the drum is a pair of running wheels, the axle of which is supported by a frame passing down under the drum and attached above to the main framework. These wheels give motion by bevel gearing to the drum which carries round the lower edge of its periphery a circular knife with either a smooth or a serrated edge. These

is a clutch for throwing the drum into gear with either of a pair of bevel wheels to give it movement in either direction. The running wheels have ratchets in their axles, to allow one of them to rotate more quickly than the other in turning corners, &c. A sharpener of any suitable material is affixed to the apparatus so that the knife is brought against it as it revolves and sharpened. To prevent the knife striking against stones, &c., there is a roller in front of the drum which raises it over inequalities of the ground. The apparatus may also be raised by a lever acting on a second roller behind.

[Pat. 1,061. Drawing.]


A.D. 1853, August 23.—No. 1965.

MCLISH, WILLIAM. (*Provisional protection only.*)—"A machine for destroying weeds," "by means of a hot roller and hot blasts." The machine rests upon a roller, the whole of which, with the exception of a space, forming an opening, at the bottom, is enclosed in a hollow fire-grate, which is itself enclosed in an iron case, "at the top of which there is a lid to put in the fuel, and a fan for the blast;" such fan deriving motion, by means of cog-wheels or otherwise, from the said roller, whereby, as the machine is drawn over the ground, blasts are driven through the fire grate to the surface of the roller, and "pass out at the back and front of the roller, close to the surface of the ground." "The hot blasts can be kept in contact with a greater or less amount of surface by longitudinal slides, which draw out close to the ground at the back and front of the roller." "When it is required to apply more heat and blast at any particular place," "a coupling is provided between the roller and the fan wheels, so that the roller can be thrown out of gear with the fan, which is then driven by a handle attached to one of the fan wheels, which when turned drives the fan." "The machine may be made of any convenient size, and may be fitted with one or more rollers and fans, as the case may require."

[Pat. 1,062. No Drawings.]

A.D. 1853, August 25.—No. 1980.

BROOMAN, RICHARD ARCHIBALD.—(*A communication.*)—(*Provisional protection only.*)—"Machinery for digging, breaking, and trenching land."



The drawing attached to the Provisional Specification represents a digging machine fitted with endless chains working round chain wheels on two horizontal shafts, and carrying transverse ribs, so as to form "a moveable platform for men, " horses, oxen, &c., to walk upon for the purpose of working " the machine ;" but it is also stated that the machinery may be worked by steam power. Motion is transmitted from the moving platform or steam-engine to a horizontal shaft on the top of a cast-iron frame at the back of the machine. This shaft is furnished with several eccentrics or cranks, connected by rods to the hinder ends of a like number of straight levers, which turn at their foremost ends upon a horizontal axis beneath the cast-iron frame ; and the hind ends of the levers are also united by links to short cross pieces, carrying the digging forks or spades. From each cross piece an arm projects backwards and is connected by a rod to the lower end of a long curved lever, which turns near its upper end upon a horizontal axis at the front of the cast-iron frame. At the top the several curved levers are united to sliding pieces, actuated by cams on the shaft that carries the eccentrics. The vibratory movement thus imparted to the curved levers causes the cross pieces with the forks or spades to turn on the pins which connect them with the links before mentioned ; the eccentric rods alternately depress and raise the forks or spades ; and the straight levers give them a backward motion as they descend in the earth. A horizontal shaft, with prongs projecting from it, revolves at the rear end of the machine in such a position that its prongs will pass between the prongs of the forks or spades as they ascend, and, taking the earth therefrom, will carry it over the shaft and deposit it again upon the land. When the ground is too loose for forks, close spades are to be used.

For breaking up stiff and hard soils a shaft provided with prongs is substituted for the forks or spades ; and as the shaft revolves, an up-and-down motion is imparted to it by means of the eccentric rods.

When the machine is to be employed in cutting trenches for draining land, an endless chain of scoops or buckets is substituted for the forks or spades.

[Printed, &c. Drawing.]



A.D. 1853, August 31.—No. 2020.

NEWTON, WILLIAM EDWARD.—(*A communication*).—"Ma-  
chinery for reaping and gathering corn, grain, and other  
"agricultural produce."

1. The cutters are mounted at the bottom of a pair of ver-  
tical cylinders, to the upper parts of which gathering arms are  
attached. The cutters consist of scythe-like blades, pivotted at  
their inner ends to a frame within the cylinder, and having  
short arms with studs moving in an eccentric groove also within  
the cylinder, the effect of which is to cause the blades to be  
protruded through openings to cut the crop on one side of the  
cylinder, and retracted on the other. The gathering arms are  
similarly actuated and they take the crop as it is cut by the  
blades, carry it round, and deposit it in a receptacle at the  
back. This receptacle may be opened at intervals, when suffi-  
cient has been collected to form a sheaf; or the corn, &c. may  
be thrown out by a revolving vertical rake driven with an  
intermittent motion. There is a row of fingers before the  
cutters, projecting into the corn. To regulate the height of  
the cut from the ground, the front of the machine is raised or  
lowered by an "eccentric lever."

2. Instead of the above cutters, rotating toothed discs, with  
curved teeth cutting against fingers, or vibrating cutters on a  
cutter bar, may be used, the rest of the machine remaining  
the same.

[Printed, *Is.* Drawings.]

A.D. 1853, September 6.—No. 2048.

WRIGHT, LEMUEL WELLMAN.—"Reaping and gathering  
"machines."

The cutters are formed of scythes carried on the ends of a  
horizontal bar, rotating on a vertical spindle at the front of  
the machine. The scythes have serrated edges. Above the  
scythes are "cradles" which receive and hold the cut crop till  
they are at the point of their revolution furthest from the  
standing corn, when each is depressed by a short arm on its  
under side striking against a fixed stop. The crop is received  
by a rake on a horizontal shaft, which, when sufficient for a  
sheaf has been collected, tilts over, and deposits it on the  
ground at the side. The machine is driven by a horse behind.

[Printed, *6s.* Drawing.]

A. D. 1853, September 13.—No. 2121.

**SMITH, WILLIAM.**—"Implements for tilling and preparing  
" land."

The invention consists in combining three or more subsoil ploughs into a single implement. The three ploughs (three being the number preferred) are connected by two cross beams. The central plough has handles, the others not; there may be a wheel on each side of the combined implement, or each plough may have a wheel. The draught chains are attached to a cross beam in front, and to this the whipple-tree is connected. Chains from the whipple-tree are led back to the handles, to assist in guiding and turning the plough.

[Printed, ed. Drawing.]

A. D. 1853, September 15.—No. 2147.

**JEANNERET, HENRY.**—The invention relates to "improvements in machinery for digging and tilling land" by animal, steam or other mechanical power, and consists in arranging two rings or discs, connected together by an axle, and by eight bars, forming a square around the axle; each of the discs is made with a groove on its side, behind the cutting edge, to traverse freely around a friction roller, which revolves on a pin, passing through the frame of the machine, or attached to other tractive media in connection with the animal or mechanical power employed, the same admitting, however, of the immediate application of steam power; the cylinder, thus caused to revolve on a moveable axis, is pressed downwards, either by weight applied upon the ends of the axle, or by levers attached to a carriage in front and passing over the ends of the axle. Four of the above-named bars, which are placed "at the angular points of the square they form round the axle," are made to play freely in the holes of the discs, "and serve to carry the spades or arms for cutting blades which are keyed on to them;" the other four bars serve as stops to the inner extremities of the said arms, in order "to prevent the spades or arms from passing beyond the right angle to the next side of the square." "The cutting plates are vertical or horizontal, or both; when horizontal, sufficient space is left between the inner edges of them and the axis of the cylinder to admit of the complete discharge and re-

" versal of the clods or admixture of the earth." "The  
 " spades, fcos, or cutters are usually fixed, but may be  
 " jointed." "The axle projects outside the discs and framing  
 " to carry rollers," "in order to determine the depth to which  
 " the cutters may be allowed to penetrate."

[Printed, *sd.* Drawing.]

A. D. 1853, September 24.—No. 2206.

AUSTIN, CHARLES EDWARD.—"Reaping, gathering and  
 " binding machine."

The cutters consist of rotating knives, revolving on a vertical spindle at one side of the framework of the machine, which is supported on a pair of bearing wheels behind, and drawn by a horse in shafts in front. The cutters are thus caused to project at the side of the machine. The knives used are formed in "the curve called an evolute," and they work between plates of such a form that the edges of the plates do not meet or depress the corn, &c., until the moment when the knife meets and cuts it. At the side of the cutters is a projecting guide to lead the corn to the cutters. Over the knives "cradles" are arranged which carry the cut crop to the centre of the circle of the knives and cradles, and there leave it, the cradles passing between upright guides, which do not allow the corn, &c. to pass. The corn may either be bound into a sheaf in this central receptacle, or it may be bound up on a platform at the rear. The mechanism by which this is effected cannot readily be explained without the aid of drawings. A fork is caused to revolve round the shaft and carry round it a tie which is placed in it by the attendant, or formed by the hook catching a sufficient number of straws from the bundle. When the tie has been thus twisted about the sheaf, other hooks are so arranged as to twist the ends of the tie together and thus secure the sheaf. The sheaf is then raised by a prong on the end of a rod operated by an arrangement of levers. If the sheaf is to be bound on the platform behind, the cradles are so arranged as to deliver the corn between guides which lead it to the platform and deliver it to the corresponding jaws which form it into a sheaf. A tie of straw is laid on these jaws in a position to receive the sheaf, and an apparatus of hooks is arranged to twist together the ends of the tie and secure it

round the sheaf. When this is done, the jaws open, and allow the sheaf to fall through an opening in the platform on the ground below.

[Printed, 1s. 9d. Drawings.]

A.D. 1853, September 26.—No. 2208.

SMITH, JAMES.—Scythes.

The object of the invention is to enable the angle of the blade and handle, and the relative positions of the blade and handle to be altered. The end of the blade fits into a hollow in a metal socket at the end of the handle, and can be secured therein in various positions by a screw. The socket has a stem on its end sliding in a second socket on the handle so that it can be drawn in and out and fixed in position by a screw. Also there is a rod or stay hooked in a hole in the blade and slotted at its other end where the slot fits over a screw on the metal socket above mentioned. By this means "the scythe is to be adjusted so as to give more or less head;" or "the scythe or blade of the scythe is to be raised or lowered on the grass" or crop to be cut;" or "the point of the scythe blade is to be raised or lowered."

[Printed, 6d. Drawing.]

A.D. 1853, October 19. -No. 2418.

DUSSUC, ALEXIS.—The invention, which relates to a combination of machinery for ploughing, levelling, drilling, distributing manure, and rolling, consists in placing "on a suitable carriage" "an ordinary locomotive engine and boiler, having two pairs of steam cylinders connected by cranks and rods to the axles of the driving wheels, which are made to revolve independently of each other, so as to allow of the machine being turned in any direction," by means of a moveable guide wheel; each running wheel "being in connection with one pair of steam cylinders. Concentric with each driving wheel is a large spur or toothed wheel, gearing into an intermediate spur wheel which actuates the ploughing apparatus;" which intermediate spur wheel can be thrown in and out of gear by an ordinary contrivance of bevil wheels, cords, and rollers. "The plough," which "consists of a number of shovel blades, attached by arms or shanks to a suitable framework," can be adjusted vertically,

and, when required, raised completely off the ground, by means of a small pinion, fixed on a suitable frame, and gearing into a rack attached to its axle. "Immediately behind the plough is a follower or iron plate for levelling the surface of the earth preparatory to sowing the seed. The apparatus for sowing the seed consists of an ordinary drill, carried upon a moveable frame, capable of being raised or lowered when required;" a series "of the tubes" are "placed in a line with the drills" "for the purpose of covering up the seed dropped by the same." "At the end of the carriage frame of the machine there is a box or chamber for containing manure, the distribution of which is regulated by a perforated cylinder attached to the moveable framework carrying the drill. Following the manure distributor is an iron roller, which covers in the seed and manure and smooths the surface of the furrow." The inventor does not confine himself "to the precise shape and construction of any or all of the parts of the machine, provided the above arrangements of such parts be maintained."

[Printed, &c. Drawing.]

A. D. 1853, November 1.—No. 2530.

BAUER, JOSEPH.--"This invention consists of a compound or combined machine for digging and harrowing by steam power. On a frame carried by four wheels (the axle of one pair of such wheels being arranged in such manner as to be inclined to the other, and thus to guide the direction of the carriage,) are fixed a steam engine and boiler, similar to those used for a locomotive, but smaller. Two levers are used, placed parallel to each other, and in a direction from the back to the front of the carriage, and they move on their respective axes. The fore ends of these levers are connected to sectors of pulleys placed above them, by ropes, chains, or straps, and by suitable gearing from the main axle; these levers are moved to a horizontal position by winding up the ropes, chains, or straps. The fore ends of the levers are connected by a shaft (across the frame); and several spades, each provided with a stout handle, are connected to the shaft. Over and across the frame, and just above the digging levers, is the main axis, which receives motion from the steam engine. By means of eccentrics the digging levers

are pressed towards the surface of the ground, and with them the spades, which are forced into the soil; and by other eccentrics, acting on the handles of the spades, the shaft to which they are attached is made to move partly round, by which the spades are raised, together with the earth they have penetrated, and the earth is thrown off by the impulse with which the spades are raised. The digging levers are then moved back to their horizontal position, and the carriage is moved a distance. Two shafts under the machine connect the digging machinery with a harrow, hanging on a separate axle at the hinder part of the carriage, and motion is communicated from the digging levers to this harrow, giving it a depressing and also a to and fro movement, so as to pass the teeth through the dug earth." The inventor does not claim as his invention "the shape of any of the described parts," "but the principle according to which the machine is constructed, that is, such a combination of these parts, if these parts be now known already or not yet wherewith the digging is performed by steam, in imitation of a man that digs and retrogrades after each stroke or cut."

[Printed, 2s. 8d. Drawings.]

A.D. 1853, November 2.—No. 2544.

HOWARD, JAMES.—"Horse rakes and harrows."

1. The teeth are made of steel, to obtain greater strength and lightness.

2. Instead of fixing the teeth by screw nuts on the upper side of the beams of the harrow, the teeth are screwed into the upper beam, thereby dispensing with the use of "lock" nuts.

[Printed, 4s. No Drawings.]

A.D. 1853, November 23.—No. 2721.

STANSBURY, CHARLES FREDERICK. — (*A communication from Thomas Frederick Nelson.*) — Apparatus for mixing manure with seed.

A box to contain the guano or other manure has within it a toothed roller working in contact with the toothed concaves. Below these is a vibrating sieve through which the manure passes to a distributing cylinder in a chamber below. This



chamber has apertures in the bottom, kept clear by a "perforated vibrating bar," and through them the manure passes into the seed trough, whence the seed and manure pass together to the seeding tubes. The openings to these tubes are kept clear by a vibrating bar with "curved wire teeth."

[Printed, Ed. No Drawings.]

A. D. 1863, November 28.—No. 2769.

NICHOLLS, ROBERT HAWKINS. — "Hoeing and otherwise cultivating land."

The improvements are described as applied to a horse hoe. In this case each hoe is affixed to a vertical stem sliding on a cross bar, and carrying above and before the hoe a small wheel. Thus each hoe can accommodate itself to inequalities in the ground. On the stem of each hoe is a small crank, and all these cranks are so connected together that the hoes, and with them the running wheels of the machine, can be turned to one side or the other to guide the machine. The hoes can also all be raised and held clear of the ground by a lever.

There is also an arrangement for preventing the "unsteady" or "rocking motion" of the horse from being communicated to the machine. A cross bar is fitted across the shafts in front of the drawing bar, and diagonals fitted across from opposite corners of the square thus formed.

Similar or modified arrangements may be fitted to ploughs, subsoil ploughs, scarifiers, grubbers, rakes, rollers, seed drills, &c., and the following improvements in some of these implements are also mentioned.

"Subsoiling is effected by attaching the subsoil plough to the beam of a plough or to a framework "as above described, giving it an independent action, vertical or otherwise; when the subsoil plough is attached to the beam of the plough it works parallel with it, subsoiling the bottom of one furrow while another is being ploughed upon it."

In "paring, skimming, scarifying, cultivating, or grubbing" land, each tine has an independent action; there is a regulating bar to prevent the tines entering too deep, and a lever is connected to "every two or three tines" to lift them independently. "A double or treble time may be used to each stem to which the lever is attached."

Ploughs have a "skim coulter" and a "regulating wheel;" also the "vertical independent action upon the beam of the plough."

In drilling machines the distributing cylinder or wheel has reciprocating movement, and "delivers the seed from grooves or recesses cut out of the sides of the wheel." "Each stem is an independent drill, and may be used singly."

[Printed Gz. Drawing.]

A. D. 1853, November 29.—No. 2775.

KELLY, PATRICK.—The invention "consists in the combination with a locomotive of an apparatus or implement for opening the land in furrows, a drill or apparatus for sowing seed, and a roller for rolling in the seed." An ordinary locomotive engine (the construction of the same not forming part of the invention) is mounted upon a frame, in the hinder part of which is mounted "an iron cylinder set round with teeth or spikes, which by means of suitable toothed gear may be made to revolve at a considerably greater speed than the driving wheels of the locomotive, and produce a corresponding effect upon the ground." "The axle" of this apparatus "is mounted in the frame, so that it may be raised or lowered by means of a lever acted upon by a screw;" it has also a limited range of upward movement in the slot, and is thereby capable of self-adjustment to the inequalities of the ground by means of an elastic bearing, consisting of an elastic spring, or being otherwise constructed, applied to the opposite end of the lever to that which is connected with the axle. Behind the revolving digger is fixed a "splash or mould board," and behind this a seed drill, which is driven by means of pulleys and a band or otherwise, deriving motion from a wheel or drum revolving on the ground. Following the drill, at the back of the frame of the machine, is fixed a roller. The front wheels of the carriage may be guided either by means of a lever handle in connection with a wheel and pinion, or else by a screw. The main wheels of the locomotive are made to turn loosely on their axle when required by means of clutch boxes acted upon by a lever. The roller and drill may sometimes be dispensed with. The inventor does not confine himself to the

precise forms and arrangements of the parts described, but he claims as his invention :—

"First, the general arrangement and combination of the whole machine or apparatus as described."

Secondly, the combination of the locomotive with the revolving cylinder or digging apparatus as described.

[Printed, 10d. Drawings.]

A. D. 1853, November 29.—No. 2779.

MOORE, JOSEPH. — (*Provisional protection only.*)—"Improvements in or additions to ploughs."

The following is the whole Provisional Specification :—

"The invention consists of two distinct parts. As it respects the first improvement, I propose to introduce into the construction of the plough a wheel or drum of iron or wood, made and attached to the plough of a suitable diameter, and of a width or breadth equal or nearly equal to the width of the share to run or travel immediately behind the share, and to serve as a substitute for the sole now in use. And, secondly, I propose to fix to the beam of the plough a wheel or drum, similar to the one above described, having on the outer circumference iron spikes or teeth, varying in length as may be required, regard being had to the character of the soil to be worked and the size of the wheel, such wheel or drum to be arranged so as to run in the furrow previously made, and lying next to the furrow in the course of being made. And I do not restrict myself to any exact position of the wheel as part of the ploughing apparatus, nor to any particular mode of attaching, detaching, or shifting it, for which in the manufacture appropriate provision will be made; this part of my invention being the combination of the wheel or drum before described with the plough."

[Printed, 4d. No Drawings.]

A. D. 1853, November 30.—No. 2788.

PATTERSON, JOHN.—"Land rollers or clod crushers."

The different discs of which the roller is composed, instead of being mounted direct on the axle, are mounted on eccentric on the axle, so that the discs rotate eccentrically to one another, and thereby exert a cleaning action one on the other. The

eccentrics are mounted on the axle, and secured together by slots and studs on their sides. The same effect may be produced by cranking the axle, and mounting each disc on a separate crank.

[Printed, &c. Drawing.]

A.D. 1853, December 5.—No. 2824.

PATTERSON, JOHN.—“Reaping machines.”

The cutter consists of a fixed blade, and the crop is forced against it by “fingers or gatherers” carried by a vibrating bar to which movement is given by a crank actuated from one of the running wheels. The fingers overlap the cutter, and are of such a curved shape that they draw the corn, &c. against the cutter, which has a serrated edge. The front of the machine is raised and lowered by a hand-wheel with an internal screw thread on the stem of the steering wheel, which is set in front of the cutters.

[Printed, &c. Drawing.]

A.D. 1853, December 9.—No. 2867.

OSBOURN, FREDERICK.—“Distribution of manure.”

At the back part of a manure cart is fitted a revolving roller carrying tines or teeth. Springs are also fitted to the roller, and these are forked so as each to embrace one of the tines. They are pressed down against the roller as it revolves against the manure in the cart, but spring up when released from the pressure and tend to fling the manure off the tines. The manure is carried along the cart to the roller at the back by means of endless chains carrying tines, or by the action of bars fitted with teeth, to which an alternate rising and falling motion is given by eccentrics at one end. The cart can be tilted by a rack and pinion in front.

For carts conveying liquid manure a similar roller revolves with its tines passing through the slots through which the manure flows to keep them clear.

[Printed, &c. Drawing.]

A.D. 1853, December 17.—No. 2943.

JAMES, ISAAC.—The invention relates to “improvements in “carts for distributing water or liquid manure,” and consists:—

“Firstly, as regards the distributor,” in “the constructing “thereof with a lid to enable it to be readily cleansed”; such

lid is described as being "formed of zinc or other suitable metal," "hinged and furnished with a bar," "and thumb-screws," "for closing the lid and rendering it water-tight," or, if necessary, "a washer of vulcanized india-rubber or other suitable elastic material may be placed between the lid and the distributor."

"Secondly," in "the combination of two or more sieves for straining the liquid as it passes into the body of the cart"; "these strainers," which "are formed of zinc or other suitable metal, pierced or perforated with holes," "fit into each other and into the top of the cart, and are furnished with handles for lifting them out when necessary."

"Thirdly," in "the use and application or employment of hoop iron covered with brown paper and white lead," inserted edgewise "into a groove or recess formed along the edge of each board," or plank, composing the body of the cart, at their points of junction—the edges of the said planks being "matched," or joined together by a plough and tongue joint,—whereby the joint is made perfectly water-tight.

[*Printed, &c. Drawings.*]

## 1854.

A.D. 1854, January 7.—No. 41.

JOHNSON, JOHN HENRY.—(*A communication.*)—(*Letters Patent void for want of Final Specification.*) "Improvements in machinery or apparatus for effecting agricultural operations, and in communicating power thereto."

Improvements on No. 1151, A.D. 1853. The matters detailed in the Specification refer to the engine employed by the inventor, and not to any of the implements described in his former Specification. They do not, therefore, form a part of the present series.

[*Printed, &c. No Drawings.*]

A.D. 1854, January 11.—No. 64.

BENNETTSMITH, HENRY.—(*Provisional protection only.*)—"Machine for mowing or reaping all kinds of corn, grass, clover, or any other field growth and lawns."

The following is the whole Provisional Specification :—

“ Said machine to consist of a carriage or frame work, composed of wood or metal, supported upon wheels ; round the nave or hub of the wheels is a band connected to a revolving spindle or shaft, the other extremity of which is inserted into the centre of a bevil wheel connected to two other lesser upright wheels ; through the centre of each passes an upright shaft or spindle, causing to revolve in opposite directions two flat circular plates affixed to their lower ends, into which plates are inserted a number of cutting scythes or knives. It can be worked by either horse or manual power.”

[Printed 4d. No Drawings.]

A.D. 1854, January 16.—No. 105.

SYKES, JAMES.—(*Provisional protection not allowed.*)—

“ Cultivation of the potato plant.”

The object of the invention is to check the potato disease. It consists in bending over and earthing up the stems of the plant while it has just finished flowering, or, if necessary, before.

[Printed 4d. No Drawings.]

A.D. 1854, February 2.—No. 260.

ATKINS, THOMAS.—(*Provisional protection only.*)—

“ Improvements in transmitting power and communicating motion to implements for agricultural and other purposes.”

The following is the whole Provisional Specification :—

“ The power I propose to transmit by means of my invention may be obtained from water, wind, steam, heated air, or any combination of these or any other agent, and which prime mover may be stationary or locomotive. In connexion with the prime mover I propose to attach a grooved wheel, which will be surrounded with an endless rope or cord, whether made of metal, hemp, cotton, or any other elastic material. I attach this rope or cord at the required distance to a frame named by me a rope cart or carrier, such being provided with pulleys, wheels, and other mechanism to secure a steady strain for transmitting power and communicating motion to a carriage which I call a ‘ communicator,’ and attached to the ‘ communicator ’ I use a cylinder



" of any required diameter, with one or more smaller cylinders, as may be required, such cylinders to be set or studded with spades, prongs, knives, teeth, or such other implements as the work to be done may require. I make no claim for any of these parts separately. My invention consists in the new combination of the machinery for accomplishing the objects set forth in the title of this Specification."

[Printed, 4d. No Drawings.]

A. D. 1854, February 9.—No. 318.

MEEÛS, PIERRE JOSEPH.—(*A communication.*)—"Apparatuses for planting grain and seeds, depositing manure, and for performing operations connected therewith."

1. A frame, resembling a common wheelbarrow with handles behind, and a single wheel in front, is drawn by a horse. It is arranged so that various sorts of implements may be connected thereto. These are all affixed to cross bars carried by the frame. The first is:—A "farrow maker" with several coulter arranged on a bar. The coulters or teeth are hinged to the bar, and the whole is weighted as required. This bar is fitted across the front of the carriage. Next behind it comes a similar bar carrying teeth to cover the seeds with earth. Behind this, again, is a set of rollers, similarly attached to the carriage. Besides these "weeding knives" and a "jointed share" may be attached to the carriage. These various implements are to be attached to the carriage according to the operation in hand.

2. A "digging panch" is described. A central tube has a pair of arms pivotted on opposite sides to short cross pieces at its ends. The arms are jointed intermediate of their points of attachment to the cross pieces. At the lower ends of the arms and of the tube are blades. At the upper ends of the arms are handles by which the blades can be opened or closed on the tube.

3. A "dibble or planter" is composed of a cylindrical case ending in a funnel and divided into two compartments side by side one for seed and the other for manure; both these boxes have openings at bottom closed by slides operated by handles beside a central handle by which the whole apparatus is worked. The seed passes down through a tube into the ground, and the manure through a tube or funnel external of the seed

tube, so that the manure is deposited round the seed. Instead of the boxes above described "seed boxes having delivery rings of different dimensions" may be used.

4. A separate roller may be used instead of the rollers described under (1). It "runs in a separate carriage which is furnished in front with two teeth to cover over the grain, &c."

[Printed, 1s. Drawing.]

A.D. 1854, February 15.—No. 364.

ASBURY, WILLIAM.—"Forks for agricultural and other purposes."

The invention consists in making the prongs of "separate pieces of steel fashioned by forging or otherwise," and securing such prongs in a head piece of suitable metal, preferably wrought iron or malleable iron, by rivetting or otherwise. No allusion is made to the use of such forks for any special agricultural purpose beyond that in the title above quoted.

[Printed, 6d. Drawing.]

A.D. 1854, February 24.—No. 452.

BENTALL, EDWARD HAMMOND.—"Ploughs or implements for cultivating land."

Various improvements on "broad share and other ploughs" are described. They are stated to be improvements on a previous Patent. They are as follows:—

1. "Adapting to the beam of a broad share plough additional arms, so as to admit of extra tines, shares, or cultivators being adapted thereto."
2. Adding additional tines, &c. "to the back part of the present arms of the broad share plough" besides the usual shares in front, so that the "several tines or shares will be arranged in pairs in advance of one another."
3. Making the "bearing edges of the arms to project above the surface of the arms, so that they may give greater length to the bearing of the stalk of the tine or share, and thereby render the stalk more capable of supporting any extraordinary strain."

4. "Making the hindermost wheel fixings adjustable" by securing the "horizontal arm called the wheel fixing" at

various points of a grooved arm by a bolt. By this means the "balance of the implement" can be adjusted.

Besides the above, the following are mentioned in the Provisional Specification but not in the Final :—

5. Making the "draw head or cat's head" of the plough in one piece, with a socket "to receive the stalk of the front wheel," and securing it to the beam by one bolt and eye.

6. Making wooden beams and handles straight instead of curved. "In adapting wooden handles to wrought iron T-beams, a slot is made in the end of the handle to fit the centre feather of the T-iron, to which the handle is fastened by bolts" and cast iron clips.

(Printed, 10d. Drawings.)

A.D. 1854, February 27.—No. 474.

JOHNSON, JOHN HENRY. — (*A communication.*) — (*Provisional protection only.*) — Harrows.

The following is the whole Provisional Specification :—

"This invention consists in constructing a drag harrow of three parts, arranged together with three joints, in such a manner as to constitute a right-angled triangle, each part having the utmost freedom of movement, and accommodating itself in a most perfect manner to the nature of the surface over which it moves. The irons are fastened into the frame in the usual manner, and horses are attached at the point where the whiffle tree is fastened. This harrow is found to possess many advantages over those in common use, such as freedom from liability to clog, thoroughness in breaking up all kinds of land, no matter how rough, and the fineness of tilth to which the same is reduced. It also possesses great advantages in its facility of bending, accommodating itself to all unevenness of surface in the most remarkable manner. The hinges are so arranged that the different parts can be detached at pleasure with the utmost facility. The principal object of the invention being the construction of a harrow in three parts, so shaped, arranged, and fitted to each other, that by their union a right-angled triangle is formed; the two hinder parts having a central union by one flexible hinge, whereby great freedom and variety of motion, with less liability to clog, is obtained."

(Printed 4d. No Drawings.)

A.D. 1854, March 9.—No. 566.

FONTAINEMOREAU, PETER ARMAND le comte de.—(*A communication.*)—(*Provisional protection only.*)—"Reaping machine."

The cutter consists of a fixed blade. An endless chain is fitted parallel to the blade, and it "carries two rows of teeth" or holders, which, passing under and over the blade "force the corn, &c. against the blade. A similar chain at a higher level carries the crop to one side and deposits it on the ground clear of the machine. There is a projecting shield in front of the machine on the side towards the standing corn.

[Printed, &c. Drawings.]

A.D. 1854, April 7.—No. 812.

BENTLEY, WILLIAM HENRY.—"Irrigators or machines for watering grass and other lands, roads, floors, flowers, plants, shrubs, and trees."

The only part of the invention which appears applicable to any of the purposes connected with this series, relates to an "irrigator" combined with a roller, and intended "for watering or distributing liquids over land." It consists of a tank mounted on wheels or on a roller, and fitted with a pump worked by a cam-wheel on the wheel axle, or by hand. There are also perforated pipes below the tank, which distribute the water, &c. on the ground underneath. Various improvements in hand watering apparatus are also described.

[Printed, &c. Drawing.]

A.D. 1854, May 12.—No. 1068.

WESTLEY, WILLIAM KING.—(*Provisional protection only.*)—"Railway and carriages to be employed thereon, applicable chiefly to farm purposes."

"The chief object of this invention is to produce a cheap temporary railway, over which light carriages suitable for carrying farm and other produce might be run."

The railway is supported on "a row of pillars, on opposite sides of which the carriages are intended to run." "These pillars project through and carry a line of wood planking, to the sides of which iron rails are affixed." To steady the carriages, "the pillars carry at their upper ends a single

"arrangement of rails, against the inner face of which anti-friction rollers mounted on the top of the carriage bear."  
 "The carriages may be transferred from one truck [77. truck"]  
 "to the other by means of turntables." These turntables  
 "may form part of the main line, and be held by catches  
 "opened by a bar on the carriage." "The supporting pillars  
 "may sometimes be mounted on moveable wheel carriages,  
 "or on floating boats or pontoons." The carriage may have  
 "wheels to run on the ground, and "the wheels may be  
 "supplied with swivels in order to enable them to run in  
 "curves." "This main weight may be borne by either rail  
 "on one or more wheels." The carriages may be drawn by  
 "simple traction" or by an endless cord, set in motion by  
 any suitable power.

[Printed, 4d. No Drawings.]

A.D. 1854, May 18.—No. 1108.

MAGGS, OLIVER.—(*Provisional protection only.*)—"Ap-  
 plying shafts to agricultural implements and carriages."

The following is the whole Provisional Specification:—

"The object of this invention is to obtain a ready adjust-  
 ment of the position of the shafts of agricultural implements  
 "and carriages. For this purpose the shafts are attached by  
 "pin joints to the implements or carriages and they have  
 "each a curved bar passing thro' them, perforated with holes;  
 "and according as the shafts are to be adjusted for a higher  
 "horse or other animal, so will be the position to which the  
 "shafts are to be raised; and they are to be retained by pins  
 "passing thro' the shafts and the curved bars, and the set or  
 "position of the implements may also be adjusted thereby."

[Printed, 4d. No Drawings.]

A.D. 1854, May 29.—No. 1183.

STEVENSON, JOHN.—(*Provisional protection only.*)—  
 Ploughs.

The following is the whole Provisional Specification:—

"This invention relates to an improved construction of  
 "ploughs, whereby a greater depth of soil is turned up and the  
 "and more effectually reversed than by the ordinary ploughs at  
 "present in use. The principal improvements consist in the

“ use of a mould board, which is so curved as to reverse or  
 “ turn the sod completely over, in place of at an angle only, as  
 “ at present. A second coulter or cutting flange is used be-  
 “ hind the front of the mould board, in order to pare a thin  
 “ slice off the solid ground after the sod has been raised there-  
 “ from, in order to prepare a proper bed for the reversed  
 “ sod.”

[Printed, 4d. No Drawings.]

A.D. 1854, May 29.—No. 1188.

TAYLOR, THOMAS.—(*Provisional protection only.*)—“ Ap-  
 “ paratus for distributing manure and vegetable substances.”

The following is the whole Provisional Specification:—

“ My invention consists in the employment of an Archimedian  
 “ screw in the place of fluted rollers, spoons, or forks. This  
 “ screw is worked by wheels gearing into a spur wheel on the  
 “ axle of the wheels of the drill, by which a constant and  
 “ regular supply of manure is delivered or deposited in the  
 “ earth simultaneously with the delivery of the seed from the  
 “ drill.”

[Printed, 4d. No Drawings.]

A.D. 1854, June 3.—No. 1239.

GOODNOW, ABEL FRANKLIN.—(*A communication.*)—  
 “ Scythe snatha.”

The “scythe snath or cradle snath” (shaft or long handle of the scythe) is formed of metal tube, bent to any form required. There is a short plug where the blade is fixed to the shaft. The blade is secured by a ring fitting over the “heel” or tang, and the end of the shaft. This ring has on it a screwed stem on which is a nut which screws down over a washer abutting against the shaft on both sides of the ring.

The “nebs” (short handles) are secured by having a rib on the shaft which fits into any one of a series of notches on the inside of the ring on the handle. A nut and screw holds the rib in the notch desired. By this means the position of the handles can be varied.

[Printed, 6d. Drawing.]

A.D. 1854, June 13.—No. 1293.

SOUTHALL, WILLIAM.—(*Provisional protection only.*)—  
 “ Apparatus for cultivating and pulverising land.”



A frame is supported on two pairs of running wheels. The front of the frame can be raised or lowered by a lever and a pair of links, and the depth of cut regulated. The implement used is a "screw or cutter" "of a gradually increasing pitch." The screw is rotated by gearing from the hind pair of running wheels. On the spindle behind the screw "are a series of "whating pins or arms" which may be arranged "in a spiral "or helical form." The arms act as pulverisers. The machine may be drawn by horse or other power, and one or more screws may be used. In transporting the machine from place to place, the screw, &c. is raised clear of the ground by elevating the front of the frame. The screw may work horizontally or at an angle.

[Printed, &c. No Drawings.]

A.D. 1854, June 15.—No. 1302.

VARLEY, SAMUEL.—(*Provisional protection only*).—"Hay-making machine."

The following is the whole Provisional Specification:—

"The object of this invention is to produce a cheap and efficient implement. The tines I divide in two groups, as usual, and mount the axle which carries the tine bars on a frame, that is supported by and capable of rocking on the axle of the running wheels. This rocking motion is for the purpose of raising and lowering the tines, and it is effected by means of a vertical screw, which acts upon the inner end of this framing, or by a pinion taking into a segment rack attached to the framing, or other equivalent mechanism. The tine axle is driven by chains from chain pulleys mounted loosely on the axle of the running wheels, and connected to the boss of the wheels by clutch boxes in the usual way. The tine bars I mount in spring clips, which are secured to and set radially around the tine axle. When, therefore, the tines in their rotation, as they pass over the hay field, meet with an obstruction that might cause them to break, their clips will permit them to fold back, and by thus yielding escape without injury past the obstruction."

[Printed, &c. No Drawings.]

A.D. 1854, June 17.—No. 1325.

WILLIAMS, JOHN ALLIN.—"Apparatus for ploughing and cultivating land."

The ploughs are contained in a rectangular framework, supported by a pair of large fore wheels (which can be adjusted to different heights) and by a single small hind wheel in a swivel frame; and at the front of the framework there is a transverse bar to receive the shafts or hauling gear for horse or steam power. Each plough is affixed to a separate beam, which extends the whole length of the framework, and is provided with suitable apparatus whereby it can be raised out of work and lowered again independently of the other beams. The rear end of the beam is slotted, to work on an upright guide bar, and the front end is jointed to a block, which is capable of sliding on a similar guide bar. The joint permits the beam to rise or fall in the rear on the plough meeting with any obstruction or great irregularity in the ground, and it also enables the attendant to raise or depress the plough by means of a short handle at the rear end of the beam. When desired, the front guide bars can be inclined laterally, "consequently giving a corresponding lateral inclination to the coulters and 'turn 'furrows' of the ploughs, which will enable them to turn the 'furrows' more efficiently when ploughing a hill-side or side-long ground." The ploughs are fixed to their beams in such positions that they stand one behind the other across the frame, so that the off or right hand plough begins to cut first, and the others follow in regular succession.

As a modification of the above arrangement, it is proposed to employ four ploughs fitted into one frame, two of the ploughs turning the furrow to the right and the other two turning it to the left,—one set being raised out of the ground while the other set is in action. "This arrangement will not involve the necessity of having a longer frame than will be requisite for a machine with two ploughs, as the ploughs in the two sets of beams or bars will be opposite each other, although in each set one plough will be placed a short distance behind the other. A short machine containing two right-hand ploughs may also be fitted with two left-hand beams or bars carrying paring shares, so that the two operations of paring and ploughing may be effected at one and the same time, by means of the ploughs passing over in the second traverse the ground previously pared in the first traverse by the paring shares in the left-hand beam."

The machine may be converted into a scarifier or cultivator by substituting drags or paring shares for the ploughs; or the beams may be fitted with land pressers or clod-crushing discs.

[Printed, 1s. 6d. Drawings.]

A.D. 1854, June 20.—No. 1349.

REEVES, ROBERT.—"Drills for drilling liquid manure."

A vessel is described for holding liquid manure, which is to be attached to any suitable drill. It has openings at the bottom, discharging into funnels which lead each to a furrow or to a seed tube. These openings are covered with gratings and have each a slide to regulate the amount passing through. Within the vessel a horizontal shaft rotates, being driven from the drill machinery, and this carries radial arms or stirrers which agitate the manure and keep the discharge openings clear.

[Printed, 10d. Drawings.]

A.D. 1854, June 23.—No. 1380.

PHILLIPS, CHARLES.—"Machinery for reaping."

Instead of a reel or gatherer an arrangement of endless bands carrying cross rods and running over pulleys is used. The pulleys are mounted on horizontal axes, one above the cutters, and the other behind the first. Motion is given to them in any suitable manner, so that the cross rods may direct the crop as it is cut back on the platform. The cutters are rotating discs, mounted side by side on a suitable frame. Each cutter works between two pointed guard plates, united in front, and these plates shield one side of the cutter so that it only acts with a portion of its circumference, that portion, viz., which is travelling away from the crop and towards the machine. On this side the cutter edge acts against a grooved piece of wood, let in between the guard plates of the next cutter. All the cutters are actuated by the same endless band which passes alternately round a pulley on each cutter spindle and one behind. It also passes round a driving pulley actuated by gearing from the running wheels.

To deliver the cut crop from the machine two curved rakes are employed. These are hung opposite one another over the platform, from a central horizontal shaft. By means of arms on the upper sides of these rakes, they are caused to travel

across the platform in opposite directions, and thereby grasp the corn lying thereon. In this position they are locked by a catch. The shaft is then moved by the action of a crank on a wheel below so that the rakes are lifted over the side of the machine, when the catch is opened, and the crop discharged. To keep the corn which is being taken up by the rakes separate from that falling from the cutters, a shield is arranged to travel to-and-fro with the rakes. A small sliding motion may also be given to the platform.

[Printed, 2s. Drawings.]

A. D. 1854, June 24.—No. 1402.

REVELL, JOHN.—(*Provisional protection only.*)—"Horse  
"hoes."

The inventor says :—

"I cause a convenient number of hoes or blades to be secured  
"to the underneath surface of a strong bar or pole, working  
"vertically & laterally in bearings connected with a frame-  
"work, secured to the axles of the machine; this bar or pole,  
"together with the hoes attached, receives motion from levers  
"or handles united at the front extremity, working in sockets  
"or on a bearing pin connected with the framework, for  
"the vertical & lateral movements respectively, & acting  
"upon the steering wheels through the intervention of a  
"steering lever connected with their axles, in such manner  
"as to give the said steering wheels a lateral movement,  
"corresponding to that of the hoes or blades. The hind  
"wheels of the machine likewise move sideways & the horse  
"is harnessed to a rack which works on a centre in the fore  
"part of the machine. The hoes or blades when taken out of  
"work are supported by catches. I employ one detached  
"hoe or blade, working in bearings in the pole so that it can  
"be lifted out of work independently of the others, as is often  
"required when the outside drills are too close to admit the  
"hoe or blade between them."

[Printed, 4d. No Drawings.]

A. D. 1854, July 1.—No. 1447.

WILDER, JOHN.—"Agricultural rollers and clod crushers."

These are composed of several rollers (preferably three) set  
in a frame, two in front and one behind, with their ends

overlapping. Both ends of the spindle of the central roller, and the innermost ends of the spindles of the two outer rollers, are mounted in slots in the frame, so as to be free to rise and fall, their movement being controlled by springs. The object of this is to allow the apparatus to accommodate itself to uneven ground.

[Printed, 10*l*. Drawing.]

A.D. 1854, July 4.—No. 1465.

GARRETT, RICHARD, and GARRETT, RICHARD, junior.—  
"Machinery for drilling seed and manure."

1. The conductors, into which the rotating cup wheels discharge the liquid manure, are fitted with valves, adjustable so as to allow a greater or less portion of the manure to pass back into the receptacle, instead of proceeding down the conductor to the drill. The valves are all operated by a single lever, which can be set at any point required. A graduated index scale is set so that the lever moves thereon and shows the amount of manure passing. The scale may be determined by experiment.

2. An arrangement for steering a drill is described. A transverse bar is attached to the fore carriage, and to each end of this is pivotted a lever which has its fulcrum in a bar rigidly attached to the frame carried by the axle. A "compound lever" is thus obtained by which the attendant can guide the machine. There may be a lever at each end, or one lever may be shifted to either side as required.

[Printed, 1*s*. Drawings.]

A.D. 1854, July 5.—No. 1474.

SYKES, JAMES.—(*Provisional protection not allowed.*) —  
"Treatment of the potatoe plant."

The object of this invention is to check the potato disease. It consists in bending over the stalks of the plants and earthing them over. It is done when the plant has finished flowering.

[Printed, 6*d*. No Drawings.]

A.D. 1854, July 6.—No. 1485.

NICHOLSON, WILLIAM NEWZAM.—Hay-making machines.

1. The axle-box of one of the bearing wheels has cast within it an internal and an external spur-wheel, either of which can

be thrown in gear with a pinion on the shaft of the wheel carrying the forks. By this means motion in either direction can be communicated to the fork wheel, while by keeping the pinions out of gear with either wheel, the fork wheel can be held stationary for travelling.

2. For raising the forks from the ground, a lever is affixed to the front of the cover of the axle box, and by acting on this by a pinion and segmental rack, the apparatus can be raised and lowered.

3. The fork heads are attached to the wheels by a "simple joint" with springs, which allow them to yield or to be folded up when not in use.

4. Shafts for these and other machines, as well as for carriages generally, are made of wrought-iron tube, bent to the form required, and attached to the frame by T pieces, &c.

Besides the above, the Provisional Specification claims:—

5. The use of wrought-iron tubes in the "manufacture of the heads to which the fork grains are attached, and the use of steel for the grains or tines."

[Printed, 10d. Drawing.]

A.D. 1854, July 6.—No. 1487.

JOHNSON, JOHN HENRY.—(*A communication.*)—(*Provisional protection only.*)—"Apparatus for effecting agricultural operations."

Improvements on No. 1151, A.D. 1853. The machine consists of a frame running on a pair of wheels and is drawn by horses. "The framework is extended downwards to carry the transverse shaft of the digging or working cylinder;" and behind is a bearing roller. The transverse shaft has keyed upon it a cylinder, on which is bolted a set of radial arms, for carrying the "digging bars or knives." These extend from end to end of the cylinder, and are "set so that on the revolution of the cylinder they are the most favourably disposed for entering the earth; and they are either made to run parallel with the digging axle, or are set spirally or inclined thereto; or these bars may be formed in double angular lengths, so as to present points and inclined surfaces to the earth during working." The digger is actuated by a pair of horizontal steam cylinders, set one on each side of the frame, the connecting rods of the two cylinders



being respectively joined to cranks fixed on the upper ends of two vertical spindles, which are connected by gearing with the digger shaft. From these spindles motion is also communicated to a transverse shaft, placed just behind the main carrying wheels of the machine. "This transverse shaft has upon it " a pair of metal pulleys, formed with india-rubber or other " elastic surfaces, each of which surfaces is opposed to the " broad periphery of one of the main carrying wheels;" thus there is a "propelling action given to the main carrying wheels " from the engine shafts through the elastic drums." The machine is furnished with a seed box, and also with a levelling board behind the digger for levelling the soil. Both of these are similar to the arrangements described in the Specification above mentioned.

An improved vertical tubular steam boiler is also described.

[Printed, 4d. No Drawings.]

A.D. 1854, July 7.—No. 1494.

MORISON, ANDREW. — (*Provisional protection only.*)—

" Protecting or preserving agricultural and horticultural " produce from disease or blight."

The following is the whole Provisional Specification :—

" My invention consists in placing metal bars, rods or wires " in the ground in such situations as may be suitable for " attracting the electricity of the atmosphere and carrying it " into the earth, and thereby preventing the ordinary effects " produced by it upon plants and crops exposed to its influence " in fields and gardens, more especially in open situations. " These bars, rods or wires may be composed of copper, iron, " steel, brass, or other metal, and they may be placed in the " ground vertically, horizontally or obliquely, according to " the disposal of the plants or crops requiring to be protected " by them."

[Printed, 4d. No Drawings.]

A.D. 1854, July 17.—No. 1570.

FOWLER, JOHN, the younger. — (*Provisional protection only.*)—"Draining ploughs."

The following is the whole Provisional Specification :—

" This invention consists in attaching to a drain plough " apparatus by means of which the coulter is progressively

" raised or lowered by the action of the machine itself, and  
" this apparatus is so arranged, that the speed with which the  
" the coulter is raised or lowered can be regulated at will, so  
" as to suit the inclination of the ground over which the  
" plough is travelling, and which is at all times indicated by  
" an apparatus attached to the machine; and to effect this  
" rising and falling of the coulter by the action of the machine  
" itself, I prefer to place on the axle of the plough a cone,  
" which by means of a strap communicates the motion to  
" another cone, which gives motion to a pinion which works  
" into a rack on the back of the coulter; and according to the  
" position in which the band is placed on the two cones, so  
" is the speed with which the coulter is raised or lowered  
" greater or less."

[Printed, &c. No Drawings.]

A.D. 1854, July 19.—No. 1587.

BALL, WILLIAM.—Drills.

The invention is stated to consist in constructing drills with  
" cast-iron press wheels running on a spindle, for the purpose  
" of pressing grooves or furrows on ploughed land on the flat  
" to receive the grain or other seed." The seed depositing  
" apparatus is of the usual character. The wheels are fitted on  
" a shaft across the carriage and below it, they have loose collars  
" between them, or bosses of such a size as to keep them the  
" proper distance apart. There is one to each coulter, and the  
" coulters are fitted to work in the furrows made by the wheels.  
" The faces of these wheels are made flat, or slightly rounded  
" in the centre, and then bevelled off on each side in the form  
" of a V." The coulters are carried by weighted levers mounted  
" on a cross shaft.

[Printed, &c. Drawing.]

A.D. 1854, July 21.—No. 1598.

CHAMBERS, THOMAS, junior.—"Machinery for distributing  
" manure."

Below the hopper containing the manure is a cylinder, extending across the breadth of the carriage. This is preferably composed of "numerous short cylinders, each having three or  
" other convenient number of inclined blades protruding a

" short distance from its periphery." The blades are capable of adjustment by being slid out sideways from the cylinder in which they fit, and replaced with either a less or a greater amount of protruding surface, this being decided by notches in the slots holding the blades, into which projections on the blades fit. The manure falls from the hopper through an opening regulated by a slide to an incline which delivers it to the cylinder, and over which the cylinder revolves. A vibrating bar carries knives which project into the hopper to break up the manure therein. Scrapers are caused to act on the blades of the cylinder to clear them from adhering manure. The whole apparatus is driven by gearing from the running wheels.

[Printed, 10d. Drawing.]

A.D. 1854, July 22.—No. 1615.

YOUNG, JAMES HADDEN.—(*Provisional protection only.*)—

" Gathering grain and other crops, and securing the same."

The following is the whole Provisional Specification :—

" For this purpose I place a framework on wheels propelled  
 " by any adequate motive power. The vehicle in its forward  
 " progress causes an endless belt, provided with projections, to  
 " lift up the grain or other crop into a receptacle placed behind  
 " it, and when there a sliding panel like a piston is moved by  
 " a crank and compresses the part of the crop taken up and lying  
 " in the receptacle into a proper compass, and holds it firmly  
 " until a ligature secures it by either of the following methods :  
 " —First, whilst the bundle is firmly held, I cause a string of  
 " suitable material provided with a button at one end and a  
 " loop at the other to pass round the sheaf, and the button  
 " passing through the loop the sheaf is bound, after which it  
 " falls or slides from the vehicle. Second, by another method I  
 " cause a species of clip with a smooth exterior to move forward  
 " until it has enclosed one end of the grain or other crop up  
 " to about midway of its length, and when it draws back, a  
 " circular band made of straw, hemp, or any suitable and  
 " elastic material is made to slide on the compressed sheaf,  
 " and the clip opening lets the tied sheaf fall on the ground.  
 " In this case the bands are tied or buttoned in the form of a  
 " loop, and struck on the clip before commencing work."

[Printed, 4d. No Drawing.]

A.D. 1854, July 24 — No. 1626.

COLE, BEATMONT, the younger. — (*Provisional protection only*) — "Agricultural machinery or apparatus for ploughing and grubbing."

The following is the whole Provisional Specification:—

"This invention has reference to a kind of rotary plough or grubber, that is, a ploughing or grubbing instrument, such, for instance, as a body, mould board, land side riser, share, coulter, &c., or any given number of these, is or are to be fixed, fastened, or attached to or upon a revolving shaft or spindle of such shape or construction as shall turn over the soil or earth in furrows (which furrows will be cut in pieces) like as the present ploughs turn the top soil to the bottom and the bottom soil to the top. If more than one ploughing instrument, &c., is or are fixed upon the same shaft or spindle, it or they may be made to revolve in the same line, similar to a wheel either of a cart or railroad carriage, and may be made to plough either deeper or thinner, or to stop ploughing. One or more of the said shafts or spindles thus equipped is to be attached to and combined with suitable framing which will connect it with a suitable steam or other power engine, which will not only work the plough, but will cause, by the aid of the wheels or rollers, the whole to travel over the field. To the above framing, drills, dibbles, rollers, or other implements of tillage might be attached."

[Printed, *id.* No Drawings.]

A.D. 1854, July 26.— No. 1645.

HUCKVALE, THOMAS. — "Machinery for gathering crops."

An apparatus for gathering and loading crops is described. A frame is mounted on wheels, and has in front a row of tines forming an incline up which the crop passes to be received by an endless band over rollers of which the hinder one is supported on a high standard at the back of the frame. The band is furnished with teeth, which carry the crop up to the top of the incline formed by the band. Near the upper roller, and in a position to receive the crop from the first band, a second band is mounted which traverses across the apparatus, and delivers the crop to a cart, &c., at the side. The tines can be raised out of work by a lever.

For gathering the crop and laying it in rows on the land, an apparatus is used like the above, but without the band which lifts the crop. The tines are similarly arranged, and they guide the crop to a transverse endless band behind, which delivers it at the side.

[Printed, 1s. 2d. Drawings.]

A.D. 1854, July 27.—No. 1655.

VARLEY, SAMUEL.—(*Provisional protection only.*)—"Reaping machinery."

"Lozenge-shaped cutters" are used "which severally rock on a centre pin, and are connected at their inner ends to a common reciprocating bar." "These cutters are pressed up to the fixed blades or stationary cutters" (which are preferably serrated) "by springs bearing against their under surface." There are "suitable projections on the fixed blades, for ensuring the requisite contact between the fixed and moveable cutting edges." To allow of the height of the cutters being adjusted, the inventor constructs "the cutter frame on the balance principle" with "arms or handles which project from the front and enable the attendant to rock the frame, and thereby raise or depress the cutters." To raise laid corn, rods supported on rollers at their ends are jointed in front of the machine. The gatherer consists of "reciprocating bars, which are carried by a crank shaft, and are raised and lowered by eccentrics, so as to produce a kind of rake motion." Receptacles are fitted at the sides of the platform to receive any grain that may fall from the ears.

[Printed, 4d. No Drawings.]

A.D. 1854, August 11.—No. 1757.

TENNANT, JOHN.—(*Provisional protection only.*)—"Grubbers for agricultural purposes."

The following is the whole Provisional Specification:—

"This invention relates to an improvement upon my well-known grubber, and which is applicable to other descriptions of grubbers and similar implements. The invention consists in fixing to each prong or tooth of the grubber, at a short distance from the point, a pair of lateral teeth, inclined backwards and slightly upwards. The pair of lateral teeth may be made of one piece of metal, and may be welded

" or otherwise fixed upon the back of the grubber prong.  
" Various proportions of the parts may be adopted, but I  
" prefer to make the lateral teeth of metal, about an inch in  
" breadth and a quarter of an inch in thickness. I make the  
" lateral teeth about five inches long, and with about five  
" inches between the points, and I fix them to the grubber  
" prong, so that their points are about six inches and their  
" root four inches above the level of the ground when the  
" grubber is resting on the surface. These proportions,  
" however, may be variously modified, but the invention  
" essentially consists in fixing lateral teeth upon the grubber  
" prongs, these teeth being inclined backwards."

[Printed, 4d. No Drawings.]

A. D. 1854, August 16.—No. 1781.

ATKINS, THOMAS, senior.—(*Provisional protection only.*)—

" Preparing land, constructing machinery, and other apparatus  
" for applying and maintaining an under-current arterial  
" circulation of fluid manure, gases, vapours, and air to the  
" seeds and roots of plants."

Tanks containing fluid manure are connected through valves with a system of perforated pipes. There is also a pump by which the "arterial circulation" of fluids, gases, &c., is to be kept up. This is "conducive to the vigorous and healthy growth of all usefull and ornamental, agricultural, and horticultural productions."

[Printed, 4d. No Drawings.]

A. D. 1854, August 16.—No. 1788.

BURGESS, WILLIAM.—"Reaping and mowing machines."

The improvement consists in the application of archimedean screws to the platform of such machines to carry the crop to the side of the machine. These screws are driven by a strap or otherwise from some running part of the machine. The Provisional Specification also refers to the use of small screws in the position of fingers, to bring the crop to the cutters, and to the employment of a broad-bladed screw in place of a gatherer, but no allusion to either of these appliances appears in the Final Specification, nor are they figured in the drawing.

[Printed, 10d. Drawings.]



A.D. 1854, August 29. —No. 1886.

HANCOCK, JAMES LAMB. — "Machinery for draining land."

"This invention consists of dividing the operation of making  
" drains and laying down tiles, which has heretofore been  
" done at one operation, namely, at the same time that the  
" plough is travelling or in action, into a series or number of  
" operations." For this purpose, the patentee connects a  
wire rope with the coulter of a plough similar to a common  
mole plough. "When the plough is drawn along the course  
" of the drain by horse, or steam, or other power, the said  
" wire rope will thereby be laid in the line of the intended  
" drain at its required depth from the surface." The plough  
having been removed, a "'mole' or 'cone' of the diameter of  
" the required drain, is now hooked at either end of the said  
" wire rope, and to the other end of the said 'mole' or cone  
" a rope is attached, by a hook or other means, on which the  
" tiles are threaded. Power is then applied to the loose end  
" of the wire rope, and the 'mole' and rope on which the  
" tiles are threaded are drawn into the drain together."

In place of employing only one mole, the patentee prefers  
to use a number or series of moles or cones, gradually  
increasing in size, one after the other. In some cases a wedge-  
shaped trench or furrow is cut to facilitate the operation of  
making deep drains. This is preferably effected by a separate  
plough with two coulters suitably set. In stony land a "long  
" cylindrical 'cone'" is to be used, to prevent deviations in  
the line of the drain. An implement is used to prevent the  
rope rising out of the land. It consists of a bent bar which  
can be driven into the land and kept down by a weighted lever.  
At its lower end is a roller under which the rope passes.

[Printed, &c. Draw ng.]

A.D. 1854, October 13. —No. 2188.

HANCOCK, JAMES LAMB. — (*Provisional protection only.*) —

"Machine for ploughing or working land."

The following is the whole Provisional Specification : —

"This invention consists of fixing knives to a metal plate  
" which is placed edgewise. The said knife or knives are  
" fixed so as to cut the land, as it were, into slices laterally  
" on both sides of the plate, and to act one after and below

" the other ; the first knife or knives to cut the land near to  
" the surface, the second to cut below the first, and the third  
" to cut below the second. In some cases I use a 'share' on  
" the front of the plate. The said plate must be fixed to a  
" suitable frame or 'beam,' and to the said frame or beam I  
" fix one or more wheels, as in the case of the common plough.  
" I do not confine myself to any particular shaped knife, nor  
" to any particular number of knives ; but I do claim for so  
" arranging knives one below the other, or after and below  
" the other, in such a way as to cut, slice, or divide the land  
" laterally into fragments. I do not confine myself to any  
" particular kind of power for working or drawing my said  
" improved ' machine for ploughing or working land.' "

[Printed, 4d. No Drawings.]

A.D. 1854, November 4. -No. 2337.

**BAXTER, GEORGE LEE.**—Reaping machines.

A circular saw rotating on a vertical spindle is mounted in the front of the machine over a fixed plate, the front edge of which is notched so as to form fingers against which the corn is cut. Below the plate, and on the same spindle with the saw, are curved "gatherers," which hold the corn against the fingers. "The gearing is enclosed in a case so curved as to lay the corn, &c. evenly upon either or each side of the machine as it is cut." Two or more saws may be used instead of one. The machine is drawn by a horse and guided by handles behind. The framing is supported on three wheels, two in front supporting the cutting apparatus, and one larger one behind, whence the cutting apparatus is driven. The above is the machine as figured in the drawing, and preferred by the inventor, but there is also a modification of it described in the Provisional Specification, and in the first part of the Final. In this the frame is supported on a pair of running wheels, from one of which motion is given to the cutter. There are no gatherers, but there are "curved guides" in front, which hold the corn to be cut. The cut crop falls into a "sloping trough" behind and thence to the ground. The saw is mounted between two discs, so that its teeth project beyond them.

[Printed, 10d. Drawings.]

" bars may be formed in double angular lengths, so as to  
 " present points and inclined surfaces to the earth during  
 " working."

The digger is actuated by a pair of horizontal steam cylinders, set one on each side of the frame, the connecting rods of the two cylinders being respectively joined to cranks fixed on the upper end of two vertical spindles, which are connected by gearing with the digger shaft. From these spindles motion is also communicated to a transverse shaft placed just behind the main carrying wheels of the machine. " This transverse shaft  
 " has upon it a pair of metal pulleys, formed with india-rubber  
 " or other elastic surfaces, each of which surfaces is opposed  
 " to the broad periphery of one of the main carrying wheels.  
 " With this arrangement as the digging goes on the digging  
 " bars are kept well fed up to their work by the propelling  
 " action given to the main carrying wheels from the engine  
 " shafts through the elastic drums." The machine is furnished with a seed-box, and also with a levelling-board behind the digger for levelling the soil, similar to those described in the previous Specification.

A modification of the machine is described. Two oscillating steam cylinders are mounted in the centre of the frame at the front end of the machine. The piston rods extend to the opposite sides of the framework, and are connected to cranks on two horizontal side shafts. These shafts are connected with the shaft of the digging cylinder, and also with a horizontal transverse shaft, which is placed just behind the main carrying wheels of the machine, and serves to communicate motion thereto. " In place of using fractional rollers or pulleys  
 " for that purpose two rollers " are employed, having a  
 " number of studs, pins, or teeth on their peripheries, which  
 " take into corresponding holes or recesses formed in the  
 " peripheries of the main supporting wheels."

An unproved vertical tubular steam boiler is also described.

[Printed, 1s. Drawings.]

A.D. 1855, . . . . .—No. 35.\*

ROMAINE, ROBERT. — Memorandum of Alteration to the Specification No. 35 A.D. 1855, filed July 9, 1856.

The Specification contains the description of two arrangements of machinery for digging or tilling land. In the ex-

planation of the second machine the following sentence occurs :—“ In place of using frictional rollers or pulleys for that purpose two rollers L are employed, having a number of studs, pins, or teeth on their peripheries, which take into corresponding holes or recesses formed in the peripheries of the main supporting wheels.” In the Memorandum of Alteration this sentence is altered so as to read thus :—“ In place of using frictional rollers or pulleys for that purpose, two pinions L are employed, having studs or teeth on their peripheries, which work into corresponding holes or teeth formed in the peripheries of the main supporting wheels.”

[Printed, &c. Drawing.]

A.D. 1855, January 31.—No. 237.

HOWARD, JAMES. — “Improvements in ploughs.” “The object of this invention is, first, to construct the frame or main part of ploughs with greater strength than heretofore, and at the same time to decrease the weight of such part, and also its liability to fracture when the plough is in use.” These advantages are obtained “by substituting for the ordinary cast-iron frame a frame constructed of plates of iron or steel, and set at a suitable distance apart, to admit of the insertion of the plough beam between them, and also of the share lever. The forward edges of the plates are covered by a double flanged piece, which is bolted thereto.” The under edges of the frame are covered by angle iron, and a piece of angle iron is inserted between the plates to give increased stiffness to the frame, such screw bolts being passed through both these pieces of angle iron for the purpose of securing the sole of the plough to the frame. The plough beam is bolted to the frame, and the “socket ends of the mould board bracket piece” pass “through corresponding holes punched in the two plates, loose collars” being placed “on the bracket ends between the plates to form abutting shoulders thereto,” whilst the bracket is secured in its place by forming rivet heads on its extremities. The rivets employed “for securing the angle iron to the plates are also similarly furnished with collars to impart stiffness or rigidity to the frame.”

“The invention relates, secondly, to a mode whereby the attachment of the lever neck to the frame is simplified. In

"place of a pivot pin for the lever to rock on," the inventor says, "I simply undercut the neck of the lever, and bevel or round the extremity of the frame, so as to fit it to the neck."

[Printed, &c. Drawing.]

A.D. 1855, February 1.—No. 246.

**JECKS, ISAAC.**—"*Machine for sweeping grass or weeds from lawns or fields.*"

The apparatus does not appear to be intended quite for agricultural purposes, nor are sweeping machines, as such, included in the present series. As however reference is made to its applicability for field use in the title as above quoted, it has seemed advisable to describe it here.

A cylindrical case is supported between a pair of wheels, from which motion is given by toothed gearing or other suitable means to a fan composed of radial blades within a wire-work cylinder. The outer case is open at bottom and in front, so that the action of the fan may drive leaves, &c. from the ground into a receptacle suspended in front of the case. The gearing is so arranged that it is thrown out of action when the apparatus is drawn backwards. The case, &c. is fitted so that it can be raised from the ground and adjusted to any suitable height by a lever handle. It is pushed forward by handles behind, or drawn by handles before, and may be of a size to be drawn by a horse or by hand.

[Printed, &c. Drawing.]

A.D. 1855, February 7.—No. 288.

**BOUSFIELD, GEORGE TOMLINSON.**—(*A communication from Abel Hussey.*)—(*Provisional protection only.*)—"*Steam ploughing machine.*"

This consists of a locomotive or portable engine, supported at the front by a single wheel, which can be turned from side to side to guide the machine, and at the back by two wheels, which receive motion from the engine, and are connected therewith in such a manner that the power may be applied to one or the other or both. At the back of the engine there is a platform to which ploughs are attached. "The ploughs are designed to run parallel with each other." They "consist of a mould board and land side only; the land side is of a sufficient size only to resist the pressure of the mould board,

“ being full at or near the coulter, and tapering to a point  
“ backwards, so that in ploughing with all the ploughs in a  
“ parallel line side by side, one plough shall turn the earth  
“ against the back side of the mould board of the adjacent  
“ plough ; this arrangement is designed for light land. When  
“ the nature of the soil will not allow of this position of the  
“ ploughs, one end of the platform will be widened.

“ In place of single ploughs, two distinct ploughs may be  
“ made consisting only of the mould boards and land sides,  
“ one a right-handed and one a left-handed plough. These  
“ ploughs are fastened together at the upper edges of the two  
“ mould boards ; this brings the heel of one and the point of  
“ the other in the same parallel, thus when one plough is in  
“ the ground with its point forward, the other plough is up-  
“ ward with its point backward. In the exact centre of the  
“ whole circumference is a gudgeon, projecting laterally on  
“ both sides. These gudgeons hang in an iron frame, which  
“ acts as a plough-beam. This double plough turns by these  
“ gudgeons ; first one is in the ground, then the other. By  
“ this arrangement, the machine will turn the furrows either  
“ to the right or the left.”

[Printed, 4d. No Drawings.]

A. D. 1855, March 12.—No. 553.

STANLEY, WILLIAM PROCKTER. — “ An improvement in or  
“ addition to clodcrushers.” The invention consists in “ the  
“ adaptation of scrapers or cleaning instruments to clod-  
“ crushers composed of a series of circles or wheels mounted  
“ independently, and free to revolve round a common axis.”  
The scrapers, which correspond in number to the grooves  
between the circles or wheels of the clodcrusher, are so hung  
to a shaft, supported upon the framework over the axis of the  
said circles, as to be allowed a little play, and extend back-  
wards and downwards so that their scoop-shaped or cleaning  
ends fit respectively one in each groove. The scrapers are  
prevented from rising too far from the wheels by a shaft or  
rod, placed across the implement parallel to the scraper shaft,  
but they “ can be adjusted to any desired position, or lifted  
“ entirely out of gear,” when required, by means of another  
rod, placed beneath the scrapers, and actuated by “ a screw  
“ lever or other suitable contrivance.”

[Printed, 6d. Drawings.]



A.D. 1855, March 11.—No. 581.

**LISTER, WILLIAM.**—"An improved implement for raising or  
 "loosening turnips and other roots in the ground, and cutting  
 "off the tails thereof." In this invention, horizontal blades  
 or cutters, the cutting edges of which the inventor prefers to  
 "stand at an acute angle to the line of progress of the im-  
 "plement," are constructed with vertical stems, which are  
 received in adjustable clamps, carried by the hind bar of a  
 wrought-iron frame, which is mounted on two running wheels  
 and a steering wheel, and is intended to be drawn by animal  
 power. The steering wheel is mounted in front of the imple-  
 ment, and has its bearings at the lower end of a vertical rod,  
 which passes through and supports the head of the frame, and  
 has affixed to its upper end an arm, which is jointed to a hand  
 lever, having its fulcrum on an upright bolted to the frame,  
 and extending backwards, passing through a guide, to the hind  
 end of the frame. "The running wheels are mounted on a  
 "cranked shaft, which passes through the sides of the frame,  
 "and is provided with a lever whereby it may be turned in its  
 "bearings, so that when the supporting wheels are resting on  
 "the ground, the frame may be raised or lowered, and the  
 "blades of the implement made to enter more or less into  
 "the ground, or altogether removed therefrom;" the lever  
 actuating the crank shaft being retained in any given position,  
 by means of a bolt or pin, projected through the said lever,  
 and through one of a series of holes, arranged segmentally on  
 a curved bar, which is bolted at its opposite ends to the frame.  
 "This implement is more particularly applicable for turnips  
 "and other bulbous roots, and it may be made to operate  
 "upon one or more rows at a time."

[Printed, and Drawing.]

A.D. 1855, March 12.—No. 618.

**SMYTH, WILLIAM.**—"Improvements in ploughing or trench-  
 "ing and subsoiling land." "This invention," the patentee  
 says, "consists of combining subsoil ploughs with trenching  
 "or double mould board ploughs, and in such manner that  
 "part of the framing by the aid of wheels will, when required,  
 "cause the ploughs to be raised out of the land. For this  
 "purpose I combine one double mould board or trenching

“ plough with two subsoil ploughs, the subsoil ploughs following in the trench made by the double mould board plough. A beam is employed, at the fore part of which is a guide wheel, and to this beam is affixed a double mould board or trenching plough. At the hinder end the beam is made with handles similar to other ploughs. To the beam is formed a framing, which at its front end has two wheels, by which the depth of ploughing is regulated; and the two subsoil ploughs are affixed towards the back end of this frame at such a distance apart as to work within the trench made by the trenching plough. In order to raise the ploughs out of the land at the end of a field, two additional wheels are used, which are carried by arms from an axis across the frame of the plough, to which axis is applied a lever or handle, by which the arms when the ploughs are at work are kept in a horizontal position, and the wheels which they carry are therefore off the land; but as soon as the lever or handle is released the wheels drop on to the land, and the continued movement of the ploughs causes them to be lifted out of the land. For some purposes I combine two of such compound ploughs into one plough, which will consist of two trenching or double mould board ploughs and form subsoil ploughs.” “In some cases I use more than two subsoiling ploughs, in which case I fix one intermediate of the other two; I also sometimes vary the form of the tines of the subsoil plough.” “I make no claim to any of the mechanical parts separately, nor do I confine myself to the details; but what I claim is, the combination of mechanical parts herein described for ploughing or trenching and subsoiling land.”

[Printed, 1854. Drawing.]

A.D. 1855, April 2.—No. 729.

PHILLIPS, FREDERICK.—“Apparatus for distributing manure, sowing or depositing seeds, and effecting the working and cultivation of land.”

The manure and seed are delivered from a box with two compartments divided vertically by a partition. In each part is a rotating or reciprocating stirrer, and the discharge is regulated by sliding bars, fluted or plain rollers, or otherwise. The seed and manure pass through separate conductors to the ground, the manure being delivered a little before the seed, in

a furrow made by a coulter, or on to the surface of the soil. After the manure depositor a loop of chain is dragged on the ground, to mix the manure with the soil before the seed is deposited. Behind the seed depositor, a pair of "shoes or breasts" is arranged to draw the soil over the seed, and ridge up the land. This operation is regulated by the size of the "shoes," which are moveable, and by weighting the ends of levers to which the "shoes" are affixed. All these can be raised out of the ground if required by a chain and windlass. "Draggs or rollers" are attached to the bar carrying the "shoes" so as to "operate upon the tops of the ridges formed by the shoes." Behind these a set of rakes or forks is arranged, each fork is three-pronged, the middle prong being behind or in advance of the other two. These are all pivotted to a bar, and can be raised or lowered by a chain and windlass. In front of the seed and manure box may be set a receptacle for water or liquid manure, provided with cocks, which may be opened and closed simultaneously by a lever handle. Any of the various parts of the apparatus may be used alone or in connection with any one or more of the others. A separate implement may be made of the forks above described mounted on a suitable carriage.

[Printed, 1s. 4d. Drawings.]

A.D. 1855, . . . . .—No. 729.\*

By a Disclaimer and Memorandum of Alteration, filed August 12, A.D. 1858, FREDERICK WILLIAM PHILLIPS, administrator to FREDERICK PHILLIPS, disclaimed all those parts of the Specification No. 729, A.D. 1855, relating to sowing seed and depositing manure, and claimed only those parts relating to the machine as employed for harrowing the ground.

[Printed, 6d. No Drawings.]

A.D. 1855, April 3.—No. 740.

PRIDEAUX, THOMAS.—"Plough for draining and other similar purposes."

The plough is supported on a pair of wheels in front. Behind these wheels a pair of cutters is fitted, and behind these again a longer pair which deepen the cuts made by the first pair. Behind these and projecting forward between their lower ends is the share. The earth, separated at the sides by the

coulter and underneath by the share, passes up an inclined board and is thrown off at the sides above the trench by side plates. The inclined board may have slots therein with rollers projecting upwards through the slots, to assist the passage of the soil. The plough is guided by a winch handle at the side which by means of a worm and worm wheel turns a cross piece to which the shafts are attached.

[Printed, &c. Drawing.]

A.D. 1855, April 10.—No. 791.

BEAUCLERK, Lord CHARLES. — "Improvements in  
"machinery for tilling and subsoil ploughing." "This  
"invention," the patentee says, "has for its object the use  
"of axes with inclined or screw-formed cutting blades thereon  
"in such manner that such axes on being drawn on or under  
"the surface of the land shall receive rotatory motion by  
"reason of the cutters or inclined or screw-formed blades  
"cutting into the land. By the application of those instru-  
"ments, the plough or machines used in carrying out  
"my invention may be arranged simply to employ these  
"rotating and cutting instruments alone, or they may be used  
"in the same plough or machine with other forms of ploughs  
"or instruments for tilling land, and the rotating instruments  
"may be used on the land, or more or less under the  
"surface of the land, according to the effect desired to be  
"obtained thereby. For this purpose, each axis is to be  
"formed with one or more cutting inclined or screw-formed  
"or screw-like blades, and the axis is to be supported by and  
"to turn on or in suitable bearings, so as to admit of its  
"revolving freely when the axis is drawn in the direction of its  
"length on or in the land, such revolving of the axis being  
"caused by the inclined or screw-like or screw-formed blades  
"or cutters being resisted by the land." The invention is  
shown in the drawing as applied to a drain plough, consist-  
ing of a beam on two pairs of wheels, the axes of which  
are capable of vertical adjustment. Passing through the beam  
behind both pairs of wheels is the stem of a "cutter," which  
as the plough advances, divides the surface of the land.  
Immediately behind the cutter, and supported in like manner  
by the beam, is a frame, the fore part of which is made with,  
or has affixed to it, a coulter or cutting edge, and to the lower  
part is attached a mole or share; whilst, supported in bearings

in the frame, is an axis having on it "inclines or screw-like blades," which, as the plough is drawn forward, cause the axis to rotate, whereby a hole is made through the earth, the soil being stirred around the axis by the blades, which "tend to form a female screw in the earth."

[Printed, &c. Drawing.]

A. D. 1855, April 16.—No. 835.

BENTALL, EDWARD HAMMOND.—"An improvement in the construction of harrows.—"This invention," the patentee says, "relates to the fixing of the tines or teeth of harrows in their sockets, the object being to prevent them from working loose. In carrying out this object, I punch square socket holes in the beams to receive the square part of the stem of the harrow teeth or tines, and through the cross bars I punch round holes, through which the threaded end of the tines project to receive a nut, as usual. When the nut is screwed up tight, I secure it in its place by rivetting," or otherwise fixing "to the bar an abutting piece, which will fit close against one side of the nut, and thereby prevent it from turning on the tine, the tine itself being prevented from turning by fitting into the square socket in the beam; or, instead of an abutting piece rivetted to the bar, I punch a hole in the bar near the socket hole to receive a key or rivet, which when driven in will, by gripping the nut or by fitting into a hollow or recess in its side, will, in like manner to the abutting piece, prevent the nut from turning."

The invention includes "any mere modification" of the above-described mode of fixing or securing the tines or teeth of harrows.

[Printed, &c. Drawing.]

A. D. 1855, April 20.—No. 887.

BENNETT, WILLIAM LEE.—(*Provisional protection only.*)—"An improvement or improvements in seed drills." The invention "consists of improvements in drills for sowing seed of various kinds, and more especially applicable to the sowing of carrot seed. The drill consists of a shaft, to which is attached a wheel. A hopper containing the seed deposits it when of a certain description in holes in a drum, whence it is deposited in a conductor, which drops it in the earth. For seed of the description of carrot seed, which is of a

“ feathery nature, and would not drop from the hopper, the  
“ drum is provided with wire teeth in its periphery that tear  
“ the seed from the hopper.”

“ Various descriptions of drums are used to suit different seeds  
“ according to the thickness with which they are required to  
“ be sown. The conductor cuts a trench and deposits the seed  
“ in the ground, and a brush is fixed between the hopper and  
“ the drum to regulate the flow of seed; an agitator worked  
“ by cog wheels on the driving wheel constantly stirs up the  
“ seed in the hopper.”

[Printed, &c. No Drawings.]

A.D. 1835, April 24.—No. 915.

UTTING, FREDERIC JAMES. —“ Improvements in land rollers  
“ and clod crushers.” The invention consists in “ the com-  
“ bination of a series of cutting rings or wheels having sharp  
“ edges, which may be either plain or serrated, with another  
“ series of rings or wheels formed with flat or nearly flat  
“ edges or rims, for the purpose of regulating the depth to  
“ which the cutting rings shall penetrate into the ground, and  
“ for rolling or levelling the same.” The inventor prefers  
to make the cutting rings or wheels with long teeth alternating  
with short ones—the former with sharp edges in the direction  
of the periphery, the latter with sharp edges at right angles to  
those of the long teeth. The “ two series of rings revolve  
“ upon separate spindles, and are so arranged that the rings  
“ of one set shall revolve partially between the rings of the  
“ other set. The spindles carrying the two series of rings or  
“ wheels are carried by a pair of moveable frames, or by two  
“ separate pairs, one or both being moveable. When a pair of  
“ frames are used, they turn on a fixed centre in a bracket  
“ bolted to the main framing of the implement. A portion of  
“ each frame may be perforated to receive pins, or any other  
“ suitable arrangement, for holding the frames in any desired  
“ position. By raising or lowering the main shafts of the im-  
“ plement and inserting the regulating pins in the proper holes,  
“ the relative positions of the two sets of rings or wheels may  
“ be altered; that is to say, either the sharp cutting rings  
“ alone may be brought in contact with the ground, or they  
“ may be elevated therefrom and the flat-edged rings brought  
“ into action only; or they may both be brought into contact  
“ with the ground together, when the action of the implement



" will be twofold ; as it will first break' or out the clods by  
 " the aid of the sharp rings, and then further reduce them  
 " and level them by the action of the flat-edged rings which  
 " also serve to keep the cutting rings clean from dirt (one set  
 " of rings cleaning the other), and preventing them from pene-  
 " trating too deeply into the ground." Many variations may  
 be made from the details shown, without deviating from the  
 principles of the invention.

[Printed, &c. Drawing.]

A. D. 1855, April 25.—No. 922.

CROSSKILL, ALFRED.—(*Provisional protection only.*)—  
 " Machinery for cutting and reaping corn grass, and other  
 " crops."

1. The running wheels of reaping machines are connected  
 with their axle by a ratchet and pall, so that they may revolve  
 without driving the apparatus when the machine is being  
 turned.

2. The height of the cutters is adjusted by " an arrangement  
 " of levers" not described.

3. The draught poles or shafts are attached to the frame of  
 the machine, so that they can be raised or lowered, in a manner  
 not described.

4. The fan or reel is affixed so that " it can be raised or  
 " lowered by means of a lever."

5. A fan or reel is added to machines having a revolving  
 cutter.

6. " A new description of framework for holding fixed guards  
 against which the cutters act " is to be used. No description  
 this is given.

[Printed, &c. No Drawings.]

A. D. 1855, April 25.—No. 940.

PEABODY, JOSEPH.—(*A communication.*)—(*Provisional  
 protection only.*)—" Haymaking machine."

The frame of the apparatus is supported by "skids" which  
 slide on the ground. A running wheel in the centre drives  
 " a pair of scatterers." The scatterers consist simply " of a  
 " barrel or axle, from the periphery of which tines or rods  
 " project. The mown crop is taken up from the ground by a  
 " set of parallel fingers, which stand out from the front part  
 " of the frame and form a kind of horizontal rake, into which

“ the grass is pushed by the forward motion of the machine,  
 “ ready to be taken up by the rotating scatterers.” These  
 “ lift up the grass or other mown crop and throw it over the  
 “ back frame of the machine.” The gearing is all cased in to  
 prevent clogging.

[Printed, &c. No Drawings.]

A. D. 1855, April 27.—No. 950.

CROSSKILL, ALFRED.—(*Provisional protection only.*)—

“ Machinery for turning and spreading cut grasses or hay.”

The following is the whole Provisional Specification :—

“ My improvements consist in a series of wheels for driving  
 “ the revolving rakes of the ordinary hay-making machine,  
 “ arranged in such manner that the two wheels which carry  
 “ the machine will cause the rakes to revolve in two different  
 “ directions and at the same speed in both.”

[Printed, &c. No Drawings.]

A. D. 1855, May 7.—No. 1014.

TYZACK, EBENEZER.—Scythes.

The inventor says—

“ This invention has for its object an improvement in the  
 “ construction of that part of the back of the blade of a scythe  
 “ which is near to the point. Heretofore in some cases, that  
 “ part of the back edge of the blade of a scythe which is near  
 “ the point has been bent or turned over for some inches in  
 “ length, in such manner as to form a shenlt to receive the  
 “ point of the strengthening rib or scythe back, which is  
 “ rivetted to the back edge of the blade, and such point of  
 “ the strengthening rib or back has in such cases been filed  
 “ away, or shaped so as to produce a shoulder at the back  
 “ edge and upper side, to correspond with the thickness of  
 “ the turned-over part of the blade. Now my improvement  
 “ consists of simply making that part of the strengthening rib  
 “ or scythe back where it enters the turned-over part of the  
 “ blade, flush and taper, and of forming the edge of the  
 “ turned-over part of the blade with a bevelled edge, so as  
 “ to require no shoulder on that part of the scythe back, thus  
 “ avoiding the cost of making such shoulder and consequently  
 “ the weakness resulting therefrom.”

[Printed, &c. Drawing.]

A.D. 1855, May 8.—No. 1030.

WILLIAMS, JOHN ALLIN.—“Apparatus for driving or actuating ploughs and other implements employed in working and cultivating land.”

The improvements consist in the employment of a hauling machine fitted with a pair of windlasses or winding drums, which are driven at a slow speed by a portable steam engine. The frame that carries the winding mechanism is supported by wheels, and is firmly secured to the framing of the engine. “The ploughs or other implements for cultivating and working the land are attached to a small carriage, giving them an independent action from the strain of the chain or rope, one end of which is connected to the said carriage, whilst the other is wound round one of the drums; the free end of the other rope or chain on the second drum, when ploughing with one-way ploughs, being attached to an intermediate rope, fitted with swivel hooks or eyes; and this rope is connected at its other end to the hauling carriage.” “A fixed table, secured to the side of the machine and engine next the ploughs, contains a row of holes at distances asunder equal to the width of furrow. In these holes is successively fixed the axis of a moveable guide pulley, round which the hauling rope is passed, after being previously passed round suitable fixed guide pulleys or rollers secured to the framing or table of the machine. A removeable guide roller is fitted on to a moveable trussel under this table, to prevent the rope from rubbing against the edge thereof, and to guide it on to the horizontal guide pulley.” A “somewhat similar table and moveable guide rollers, forming part of a framework on travelling wheels, with a small adjustable guide pulley” is fixed at the opposite end of the “field.” A fixed horizontal guide pulley is attached to this last-mentioned table, and round it is passed the intermediate rope above referred to.

One or more furrows may be ploughed at once, according to the number of ploughs employed; and the field may be ploughed “either in ‘towards,’ or in what is termed ‘one way.’” Each time the ploughs are drawn across the field, the moveable guide pulleys are advanced a certain number of holes in the tables, according to the number of

furrows made at one time. "On the ploughs arriving at one end or side of the field, if they are one-way ploughs, the second drum is thrown into gear, and draws them back again; whilst the first drum is thrown out of gear, to allow its rope to be uncoiled by the back traverse of the hauling carriage, in readiness for the next succeeding traverse of the ploughs." To prevent the ropes chafing against the ground, they may rest on suitable carriages or troughs running on wheels. "A bell and signal apparatus is fitted on to the table or framework at the opposite end of the field from the engine," to indicate the time at which the ploughs arrive at the end of the furrow. This hauling mechanism may be employed for working any agricultural implements which require to be drawn over the land, such as harrows, grubbers, scarifiers, land rollers and clod crushers, reaping and mowing machines, &c.

[Printed, 1s. 6d. Drawings.]

A.D. 1855, May 9.—No. 1040.

COCKEY, EDWARD, COCKEY, HENRY, and COCKEY, FRANCIS CHRISTOPHER. — (*Provisional protection only.*) — "Improvements in clod crushers and land rollers." This invention relates to an improved form of "clod crushing and land pressing roller, and also to an improved scraper or cleaner to be used in connection therewith, or with any other description of roller or clod crusher. According to this invention, the clod crushing or levelling portion of the implement is composed of one or more cylinder or cylinders of a corrugated form, or of a cylinder or cylinders having projecting rings of any shape cast on the surface thereof. The scraper may be made either to correspond with the corrugations or projecting rings on the implement described, or it may be made to suit any wheel clod crusher, or with a plain straight edge for a plain cylinder roller."

[Printed, 4d. No Drawings.]

A.D. 1855, May 16.—No. 1104.

PLENTY, EDWARD PELLEW, and PAIN, WILLIAM. — "An improvement in ploughs." The invention consists in adapting to "wheel ploughs, and implements used in the

"cultivation of land, requiring alteration of depth," an improved arrangement for raising and lowering the wheels." For this purpose the wheel stalk is formed in two divisions, the lower part consisting of a plain square stem, the upper part being a screw. The wheel stalk passes through two apertures in a forked guide attached to the plough beam. The lower aperture has a square hole through which the wheel stalk slides, while the upper one carries a revolving nut and handle. On turning this handle the nut rotates, and according to the direction in which it is turned the wheel is either raised or lowered. Each wheel of the plough is thus capable of a separate and independent adjustment with facility."

[Printed, &c. Drawing.]

A.D. 1855, May 16.—No. 1111.

MURDOCH, ROBERT. — (*Provisional protection only.*) —

"Improvements in agricultural apparatus for sowing seeds and for depositing manure." "The main feature of the improvements is the use of glass chambers or vessels for containing the seed to be sown," whether turnip, clover, cereal, or other seed, "or the manure to be deposited, so that the operator can watch the action of the apparatus; that is to say, so that he can see whether the seed or manure is being deposited in a regular and uniform manner, and at once make any adjustment or rectification if required, and so that he can see when the seed is exhausted, and at once add a fresh supply. This improvement is applicable to all kinds of sowing machines at present in use, and may be carried out by making the seed or manure containing vessel either wholly or partially of glass. According to one modification of the improved sowing apparatus, and one which is suitable for sowing turnips, the seed container is an oblong, cylindrical, or globular vessel of glass, by preference of the description known as 'crystal,' which is mounted on a horizontal spindle, and is made to rotate as the apparatus proceeds. This glass vessel has holes drilled through it at equal distances round its circumference at or near its longitudinal centre. The seed is introduced at an opening formed in the vessel at any convenient part, and closed in any convenient manner during the action of

" the machine, and it issues through the circumferential perforations as the vessel rotates. The seed thence passes down guide tubes, which deposit it in the earth, and which may either be of the ordinary kind, or they may be made wholly or partially of glass."

[Printed, 4d. No Drawings.] See No. 2357 (1855.)

A.D. 1855, May 24.—No. 1177.

VON GILGENHEIM, THEODOR Baron. — "Machine for tilling land."

A number of forks or spades are placed around a polygonal plate, termed the "laborator," and revolve therewith,—their sides being nearly in the same plane with the sides of the plate during three-fourth of the revolution, and nearly at right angles thereto during the remaining fourth of the revolution. A small opening is made in the plate near the edge for the reception of the short helve or handle of each spade, which is curved, in order to pass through from one side and extend on the opposite side towards the centre of the "laborator," and the helve is connected to the plate by axes or trunnions at the opening, so as to admit of the spade being moved into the position above mentioned. This movement is effected by means of a "stationary excentric wheel," placed parallel to the "laborator" but at such a distance therefrom as to permit the inner ends of the helves to travel in the space between them, where the "laborator" revolves; but on each helve reaching the lowest point in the circle of rotation, it is pressed down by the excentric wheel, and its spade is consequently moved into nearly a horizontal position. The spades therefore enter the ground edgewise, or in a direction coinciding with the plane of rotation, and are then caused to turn upwards, so as to throw the earth sidewise into the furrow previously made by the machine.

For ordinary digging the machine may be furnished with several "laborators" revolving side by side. "When it is intended to enter deep into the soil or to dig a trench, two "laborators," should be placed in position one behind the other, while ploughing the same furrow. The shovels of "one laborator can be placed breadthwise." In the latter arrangements, suitable means are adopted for turning the



spades as they leave the ground, in order to throw over the earth which they have raised.

A cylinder armed with iron spikes may be caused to revolve either behind, or at the side of each "laborator" for the purpose of breaking the clods,—a "pressure plate" serving to squeeze the clods against the spiked cylinder.

[Printed, 10d. Drawings.]

A.D. 1865, May 28.—No. 1222.

COLEMAN, RICHARD.—"Improvements in the construction of land rollers, and in implements for ploughing or breaking up, or scarifying the soil."

1. A land roller is described. This is made in three or more sections or divisions, each of which has a separate axle. The axle may be in the same line, or nearly so, or the different parts of the roller may follow one another in two lines, the edges overlapping to avoid seams in the land. When the different sections are in the same line or nearly so, a second set of rollers is required behind to treat the portions of soil left between the edges of the first set. The axles are mounted in bearings in swinging frames so that the different parts can accommodate themselves to inequalities in the ground.

2. The second part of the invention consists in arranging plough or other tilling implements in a carriage in such manner that they may be elevated or depressed independently of the elevation or depression of the carriage frame (to which the traction chain is attached), for the purpose of regulating the depth to which such implements penetrate, or withdrawing them altogether from the soil. The patentee says, "For this purpose, I prefer to mount two, three, or more ploughs in a position diagonal to their direction of motion, so that the one acts in advance of the other." "Each plough has a vertical stem or stems, which fit into sockets in a lower frame," travelling on wheels. These stems are free to slide vertically through the sockets, and are attached to an upper frame, which "is free to move up and down, and at the same time to maintain a position parallel to the lower frame." "This upper frame is suspended from the short end of a main lever, whose fulcrum is mounted on the lower frame; the free end of the lever projects towards the rear of the machine, or in other convenient position, where the attendant can act

" on it for the purpose of raising or lowering the ploughs."  
 " The connections between the lever and the upper frame are  
 " such as to move it and maintain its parallelism with the  
 " lower frame, assisted by links or guides to produce that  
 " effect. Instead of using an upper frame, guides may be  
 " carried up from the lower frame to keep the plough stems in  
 " an upright position, while they are controlled or supported  
 " by rods or links, by which the required motion and regula-  
 " tion is communicated." Scarifiers may be substituted for  
 the ploughs.

[Printed, 1s. 10d. Drawings.]

A.D. 1855, June 2.—No. 1264.

ARMELIN, FRANÇOIS CELESTIN, junior.—" Certain improve-  
 " ments in ploughs." In the improved plough, the draught  
 chain is connected "to a hook fixed in front of the front sheath  
 or support for the ploughshare," and is regulated both hori-  
 zontally and vertically by means of a regulating draught bar,  
 passing through the fore end of the beam. The inventor pre-  
 fers "to make the beam of fir instead of hard wood." The  
 ploughshare, which is made with, "the point of the share  
 " moveable and separate from the side piece or feather,"  
 " consists of an iron bar which slides in a V groove on the  
 " front sheath (which is fastened at top to the beam, and in a  
 " slot in the back sheath, which is also fastened at top to the  
 " beam): it also passes through a groove in a snug cast on the  
 " top of the sole plate. The bar is held in position by wooden  
 " or iron wedges." "The groove in the snug on the sole fits  
 " close to and coincides with that on the back of the front  
 " sheath, so that on passing the bar through the grooves the  
 " front sheath sole plate and point of the share are held  
 " together by one and the same wedge or key." The end of  
 the bar or ploughshare is steeled by placing upon it a small  
 quantity of prussiate of potash, making it red hot in the fire,  
 and then plunging it in cold water. The front sheath and mould  
 board are cast in one piece; "the side piece or feather of the  
 " share is fixed to it by a cast-iron tenon (made in a piece with  
 " it) and a key (or cotter)." "The back sheath" is fixed at  
 the bottom "by a stop or tooth in a mortise or slot made in  
 " the sole of the plough, and the front sheath is held in the  
 " groove in which the bar of the ploughshare travels." Pms

or cotters are employed to fasten the beam to the body of the plough, but all the parts of the share are held together and in "place by wedges, in such manner that when the iron bar is "taken out, all comes to pieces." The sole of the plough is fixed to the mould board by a tenon passing through an oval aperture in the mould board, and is provided with a heel piece, "which can be easily fitted in or taken off by a wedge." The shoe is fitted under the share in such manner as to cause it to give the necessary cut or furrow; "it prevents the sole of the "share from being subjected to wear, and is fastened by a "tenon passing into" a "groove in the share and held by a "nut." The coulter is connected to the beam by a tie piece, the ends of which are joined by a plate, the coulter being held firmly against the beam by a wedge. The inventor reserves to himself "the right of employing a square or rectilinear mould "board."

[Printed, &c. Drawings.]

A.D. 1855, June 12.—No. 1843.

FORD, HENRY WILLIAM.—"Apparatus for effecting agricultural operations." The invention relates to the employment of a "self-locomotive agricultural engine" of peculiar construction, and various apparatus or implements to be adapted thereto and worked thereby; which implements may, however, be worked separately by horse power, if desired. The locomotive engine is supported by two pairs of broad running wheels, the hind pair being driven by gearing from the crank shaft of the engine, by which either a regular progressive motion can be imparted to the machine, or an intermittent onward movement, according to the operation to be performed. A frame is fixed to the hind end of the engine to carry the working implements or apparatus.

The apparatus applied to the machine when the operation of digging is to be effected consists of a frame, composed of two wheels fastened on the ends of a hollow axle, which is placed on a solid horizontal axle carried by the hind framing of the machine, and receives an intermittent rotary motion. Radial slots are formed in the arms of each wheel, to serve as guides to as many straight bars, which extend from one wheel to the other, and carry a series of spades or forks; such spade bars moving to and from the axle as the digging frame rotates. The

patentee says, "the operation of the diggers and its result  
" closely resemble the operation of hand digging,—the spades  
" or forks being pushed into the earth by a rod, which I term  
" the treadder, actuated direct from the crank shaft; and  
" having raised the soil, they turn it over and deposit it again  
" face downwards. The machine then makes another move  
" forward, bringing a fresh set of spades into operation, whilst  
" the spades or forks which have last been in the earth are  
" cleaned by passing edgewise between fixed cleaning prongs."  
The diggers may be made to turn over towards each other in  
pairs or in any other direction, and thereby deposit the soils or  
spits so as to form furrows or ridges, or to leave the ground in  
an even state. "The several sets of diggers are only pushed  
" out of the digging frame when required to enter the ground,  
" one half being always inside the frame, which frame is not  
" in contact with the ground, but rotates a short distance  
" above it. These diggers may be used for cutting drains,  
" making excavations, and loading carts or waggons." A  
revolving harrow may be fitted to the machine. This is com-  
posed of an "endless chain of bars carrying prongs or spikes  
" which enter the ground and remove therefrom weeds or  
" other extraneous matter, which is drawn up an inclined  
" plane and deposited in any suitable receptacle; or a spiked  
" roller may alone be used."

The machine may be furnished with a "clod divider," com-  
posed of "a number of revolving spikes, which bring the clods  
" against a series of fixed spikes, prongs, or cutters, through  
" or between which the revolving spikes rotate." Or two  
spiked rollers may be used, revolving in opposite directions,  
and breaking the clods between them.

Another implement to be connected to the machine is a  
"furrower, which is composed of a number of double-turn  
" furrows or wedge-shaped implements, which furrow the  
" ground, or turn it over on one or both sides. These furrows  
" are made to work either in a rotatory or rectilinear  
" direction."

"Revolving hoes, working either vertically or horizontally,  
" may also be employed in this machine for hoeing drilled  
" crops and effecting hoeing generally; the hoes being made  
" to rotate at a greater speed than the traverse of the machine  
" over the ground."

"A hay turner of the ordinary construction may be worked by and fitted into this machine, being driven direct from the engine by means of driving bands or other suitable arrangement."

A hay collector may likewise be applied to the machine. This implement is composed of "a series of rakes, fitted on to vibrating vertical levers or spindles, and made to approach to and recede from each other, thereby drawing the loose hay into lines or ridges."

Another implement consists of a hay rake, "which is fitted into the machine, and serves to rake the hay together."

A modification of the digging apparatus is described for making deep drains. In this only one digger-blade is used. It is driven into the ground by a "treadder" actuated by a crank. It is raised by a segmental lever depressing its end and turned over by studs sliding in grooves on the lever. To enable the machine to ascend very steep gradients, or to pass over bad ground, a small grapnel or anchor may be fixed in the earth, and a rope conducted therefrom to a drum on the main shaft of the engine, which will wind up the rope and thus draw the machine over the land.

In conclusion, the patentee says, "all existing kinds of implements may be worked by any machine, if adapted to it; and the engine is designed to serve nearly all the purposes for which horse-power is at present employed."

[Printed, 2s 10d. Drawings.]

A.D. 1855, June 18.—No. 1385.

BLANCHARD, THOMAS.—"Method of bending timber."

This invention consists in bending wood or timber so that the piece may be "subjected to pressure on all its sides during the process of bending, in place of simply being bent over a form." "By this means the wood or timber is prevented from swelling or bursting." The apparatus consists of a lever to which "is attached a trough of the curve to which the wood is to be bent, one side of the trough being moveable, so that it may be pressed firmly against the surface of the wood by wedges."

Underneath the lever mentioned is "a travelling table, the distance of which from the curved form can be adjusted by a screw." "The piece of timber to be bent is laid on a

“ flexible band of metal placed on this table and clamped  
“ down thereon so that it is pressed upon all sides; one end  
“ of the timber is then clamped to the fore part of the curved  
“ trough on the lever, the flexible band of metal being taken  
“ hold of in the clamp as well as the timber. The other end  
“ of the timber butts against a block, acted on by a screw,  
“ which passes through lugs in the travelling table. When  
“ this is all arranged, the lever is drawn down, during which  
“ operation the timber passes into the curved trough; when  
“ this is done the two ends of the piece are connected together  
“ by a tie, which takes hold of the ends of the flexible band  
“ before mentioned and afterwards the wood, still confined  
“ by the curved trough, the flexible band and the tie is re-  
“ moved from the machine, and is so held until it is set.”  
Among the articles which may be formed in this machine,  
plough handles are mentioned.

[Printed, 1861. Drawing.]

A.D. 1855, June 25.—No. 1448.

YOUNG, JOHN. — “Improvements in and application to  
“ harrows.”

The invention “has for its object the removal of obstructions  
“ from the teeth or projections of agricultural implements of  
“ this description while they are at work, so as to obviate the  
“ necessity of occasionally stopping their working for the  
“ purpose of clearing them. And this effect is accomplished  
“ by adapting and applying to the teeth of the harrow (com-  
“ monly called a ‘grubber harrow,’) tongues or guides of such  
“ form as to be capable of clearing such teeth as they pass  
“ through the land, by raising up and throwing off couch  
“ grass or other obstructions gathered by the teeth in the  
“ course of their progress.” “The tongue or guide is applied  
“ to the lower part of the tooth in front, or the tooth is formed  
“ with the tongue or guide upon it, and the tongue or guide  
“ extending upwards from the lower part of the tooth is at its  
“ upper part bent on one side, so as to be adapted to raise  
“ and turn off the couch grass or other obstructions as they  
“ accumulate, and prevent their resting upon the body of  
“ the tooth.” The tongue or guide “may be forged on the  
“ tooth, or otherwise applied thereto” and it “may be varied



" in size and form, so as to adapt it to the teeth of the particular implement to which it is to be applied, so long as its form remains suitable for turning off obstructions from the tooth." The invention may be applied to any form of tooth, " provided it be always of such form as to admit of the tongue or guide being fixed so as to operate at a sufficient distance in front of the body of the tooth."

[Printed, &c. Drawing.]

A. D. 1855, June 28, —No. 1471.

**WALKER, HENRY.** — "Improvements in ploughs for ploughing or tilling land." In reference to the invention, the patentee says, "It consists in adding to the ordinary plough an additional coulter, and sometimes more than one additional). If one additional coulter be used, I place it a little in advance of the usual coulter, and on the right-hand side of it (as in use), and at about the centre of the furrow to be lifted, so as to split it before it reaches the mould board, by which it is lifted and turned over. If the action of the usual mould board do not sufficiently separate each divisional portion as left by the coulters, I then propose to rib the mould board, or give it different inclinations, so that each section of the soil will be lifted at slightly different intervals, and being completely detached, a greater surface will be exposed to the influence of the atmosphere. When more than one additional coulter is used, I place each slightly in advance of the other, and at such widths apart (lengthways that they will divide the furrow equally into as many portions as there are coulters in use to the furrow, care being taken that they are so placed as not to bind each other by holding the soil between them. The under surface of the plough in ordinary use often glazes the soil it has passed over; to avoid this I either make indentations on the under side of the plough to obtain an uneven surface, or I place one or more points on the under side of a plough that will act at slight depth similar to the harrow teeth on the bed of the furrow." "The position of all or any of the coulters can be varied as may be found desirable without departing from the principle of my invention."

[Printed, &c. Drawings.]

A. D. 1855, June 29.—No. 1489.

**HEAPS, WILLIAM.**—(*Provisional protection only.*)—"Improvements in machinery or apparatus for working or cultivating land."

The invention relates to harrows, and consists "in imparting a lateral vibrating or reciprocating motion to the teeth of the harrow during the forward movement or traverse of the machine." This is effected by means of two side levers attached at one end by chains to the harrow, and connected at their opposite ends to a crank lever in front of the axle of the carrying wheels. A suitable lever is employed for raising the harrow from the ground when requisite, and suitable disengaging levers are employed for throwing the machine out of gear when found desirable. When two horses are used, instead of having a separate back band for each horse, one band alone is used, the band passing over the back of each horse, and under a pulley on the middle shaft, being thereby adjustable to the height or level of each horse, according to the irregularities of the ground."

[Printed, &c. No Drawings.]

A. D. 1855, July 5.—No. 1511.

**HOWARD, JAMES.**—(*Provisional protection only.*)—"Improvements in the construction of ploughs." "This invention relates to the mounting of the wheels of ploughs, the object being to facilitate their vertical and lateral adjustment to suit varying widths and depths of furrows." This is attained "by mounting the wheel stalks or standards in horizontal sliding frames, which fit on the plough beam, and are traversed by means of an adjusting screw, with which they are severally provided. These screws pass through the plough beam, and on being turned will move the wheel stalk nearer to or farther from it, to suit the width of furrow required to be made."

"The vertical adjustment of the wheel stalk or standard which slides in socket holes in its frame" is effected "by dropping over the stalk a threaded collar or hollow screw," which is keyed "at any required elevation to the stalk. Upon this screw works a threaded nut provided with two shoulders which embrace the frame and prevent the threaded collar

" and stalk from slipping in the frame. When it is required  
 " to depress or raise the wheel or wheels it is only necessary  
 " to turn the nut, and the adjustment to suit a deep or shallow  
 " furrow will be readily effected. The vertical adjustment of  
 " the wheels may also be effected by threading the stalks or  
 " standards, and so fitting them to receive the nuts; but the  
 " threaded collar admits of the position of the wheels being  
 " altered to a greater extent."

[Printed, 4d. No Drawings.]

A.D. 1855, July 19.—No. 1629.

FISKEN, DAVID, and FISKEN, THOMAS ROBERT HAY. —  
 " Transmitting steam or other power for the tillage of land by  
 " ploughs and other instruments, as well as for other pur-  
 " poses."

Among the uses to which the apparatus can be employed are mentioned "the working of reaping and mowing machines,  
 " and machinery for cutting drains, or the hauling of manure  
 " carts, drills, rollers, harrows, &c." The ploughs, &c. are supported in the extremities of forked levers in a suitable frame, and these are connected to a slotted lever by "a bell  
 " crank and connecting rod, by means of which the implements  
 " are alternately raised out of or lowered into the land, so  
 " that while one set is in action the set on the opposite side of  
 " the bell crank is out of work." The power from the prime mover is transmitted by an endless rope, which passes under a guide pulley upon the ploughing machine, and over a driving wheel upon the axis of which are keyed pinions, which impart motion to a drum, round which a wire rope or chain is wound; this rope after passing under two guide pulleys carried by the ploughing machine is fastened at each end to anchors placed at opposite sides of the field. "When the endless rope is set  
 " in motion the resulting action of the drum against the wire  
 " rope or chain causes the machine with the ploughs or other  
 " implements to be drawn across the field." When the machine has arrived at one side of the field, that set of ploughs or other implements which has been in work is raised out of the ground, the machine is shifted sidewise a distance equal to the breadth of the set of implements, and the opposite set of implements is lowered into the land. Then, by means of

reversing gear, the drum is made to revolve in the opposite direction, and the machine is thus caused to travel to the other side of the field. "A small flying capstan is used for taking " up the slack of the endless hemp rope."

The endless rope passes in the following manner round pulleys so situated that it extends along one side of the field as well as from one side to the other. From the steam-engine, which is situated at one end of the field, the rope proceeds along the side of the field to the flying capstan, secured at the opposite end; after passing around a pulley or sheave on the capstan, it returns along the side of the field until it comes to a double-grooved pulley on the carriage of the anchor to which one end of the wire rope is fastened; from this pulley it is conducted across the field to the other anchor carriage, and after passing around the pulley it returns across the field to the first-named anchor carriage; and from the pulley of this carriage it proceeds to the steam-engine, passes around a pulley or drum driven thereby, and thence again to the flying capstan. When the ploughing machine is moved sideways after each traverse a corresponding movement is imparted to each anchor carriage, by connecting the spindle of its double-grooved pulley (driven by the endless rope) with suitable apparatus whereby motion is communicated to a small barrel, which winds up a chain fastened to a stake firmly secured in the ground, and thus draws along the carriage. The flying capstan is moved when necessary, in order to take up the slack of the endless rope, by communicating motion from the axle of its pulley to a winch barrel, and thus causing the latter to wind up a rope, and thereby draw the capstan forward.

[Printed, 1s. 4d. Drawings.]

A.D. 1855, July 24.—No. 1672.

BRADLEY, LONSDALE. — (*Provisional protection only.*) — Reaping machines.

1. The cutters are sickle-shaped and are fitted on rotating discs. A shield is fitted over the discs to guide the corn to the sides of the machine as it is cut.

2. Ratchets and palls are fitted to the wheels, to allow of the wheels running backward, and to permit the machine to turn freely.

[Printed, 4d. No Drawings.]

A.D. 1855, July 30.—No. 1792.

HANSON, JOHN.—“Apparatus for digging potatoes.”

The implement consists of a frame supported on four running wheels. The wheels of the main axle are of large diameter, and are furnished with radial spikes on their peripheries, so as to have a firm hold upon the ground. A horizontal shaft, driven by bevel gearing from the main axle, projects from the rear end of the frame, and carries a series of radial forks, which revolve in a plane at right angles to the line of traverse, and, “entering the drill or ridge of potatoes, scatters these out from the earth” towards the side. “The earth and potatoes are primarily lifted by means of a species of inclined plough plates” attached to the frame immediately in advance of the forks, and from which the forks lift the potatoes. In order that the potatoes may always be thrown to the same side in whichever direction the machine is going, there are two bevel wheels on the main axle, either of which can be slid into gear with the pinion driving the rotary forks. These accordingly can be rotated in either direction. There are therefore two “plough plates,” one on each side, and the one not in use can be turned up out of the way. To prevent the potatoes being thrown too far, a curtain of sucking, &c. may be suspended so that they are thrown against it, and fall evenly on the ground therefrom.

[Printed, 10d. Drawing.]

A.D. 1855, August 2.—No. 1794.

SMITH, NATHANIEL.—“An improved horse rake.” The frame of this implement has wheels attached to its sides, and consists of two cross-bars or beams extending from side to side, and of two side pieces which terminate in arms projecting towards the front, and having their ends connected by a rod, “which supports the rakes when raised, and prevents their falling over to the front of the machine.” The shafts are attached to two branch irons, the hinder extremities or forked ends of which are secured to the cross bars of the frame. The rakes are mounted loosely and independently on an axis, “which extends from one of the side arms of the frame to the other, and is also supported by being passed through two of the branch irons to which the shafts are attached.” On this

arms are pivotted or jointed "four or more arms or levers, which project backward and carry a rod or bar which extends across the machine, and on which the beams or shanks of the rakes rest," so that by means of a lever connected with this rod or bar, and centred on a weigh shaft, which passes through bearings attached to the shafts, an attendant at the front of the implement can raise the rod together with the rakes without stopping the horse. The action of this lever may be assisted by employing a second lever, centred at the opposite end of the same weigh shaft, and connected with the bar on which the beams of the rakes rest. The beams or shanks of the rakes are formed of tubular iron; the tines are made of steel, and each of them terminates at the top in an eye, by which it is fitted on to the beam.

[Printed, 6d. Drawing.]

A. D. 1855, August 20.—No. 1952.

STANSBURY, CHARLES FREDERICK.—(*A communication from Edgár M. Stevens, Joseph B. Crosby, and J. W. Pearson.*)—*Provisional protection only.*—"An improved seed planter."

"The object of this invention is to supply by cheap machinery the place of skilled labor in the agricultural operations of broadcast sowing and drill planting. Its nature consists in the employment of a peculiar feed and distributing apparatus, so arranged and operating as to prevent the accidents which are apt to be caused by irregularities in the surface of the ground. We make use of feed rollers with elastic surfaces in connection with an expanding tube spreader."

[Printed, 4d. No Drawings.]

A. D. 1855, August 29.—No. 1953.

HANSON, JOHN.—"Apparatus for digging or working land and removing roots or plants therefrom."

This invention relates to apparatus for effecting various agricultural operations, more particularly the disintegration and working of the soil. The machinery is "mainly based upon the mechanical contrivance" described in No. 1732, A. D. 1855, and "consisting of an open frame carried upon wheels, the wheel movement being in connection with a set



" of rotatory forks or diggers, arranged to rotate in a plane at  
 " right angles to the traverse of the implement. Under the  
 " present arrangements, however, the actual potato digging  
 " apparatus is replaced by other rotating parts, capable of  
 " effecting the further operations now contemplated. These  
 " operations are, digging the soil as a substitute for ploughing,  
 " clod breaking, turnip and root thinning, and hoeing." The  
 machine is supported by a pair of small adjustable hind wheels  
 and a central front wheel of large diameter, having radial  
 spikes on its periphery, to ensure its rotation when the  
 machine is drawn forward. From the axle of this wheel motion  
 is communicated to a horizontal shaft, which projects from the  
 rear end of the machine, and carries a series of radial knives or  
 blades. The soil is first raised by a broad ploughshare or  
 ploughshares, and is then cut up and disintegrated by the  
 action of the rotatory blades. Two seed boxes are fitted to  
 the front end of the framing; and connected with these is any  
 suitable depositing apparatus.

When the machine is to be used for turnip and root thinning  
 or hoeing, the rotating blades and share or shares are removed.  
 Beneath the rear end of the framing there is a short horizontal  
 shaft, which extends lengthwise of the machine, and is driven  
 by gearing from the axle of the large front wheel. Upon this  
 shaft is fixed a pair of discs with radial arms, which carry at  
 their outer ends four straight blades or hoes, placed parallel to  
 the shaft, "and, as each comes round during the onward  
 " traverse of the implement in thinning, it scoops or cuts out  
 " from the ridge the plant or plants at regular intervals as  
 " under."

[Printed, 1s. Drawings.]

A. D. 1855, September 20.—No. 2120.

PALMER, JOHN.—"Reaping machines."

The invention relates to such reaping machines as are fitted  
 with a "radial roller platform." The last roller, or that which  
 delivers the crop to the ground, is rotated from the driving  
 gear, and from it motion may be given to the next one or two  
 rollers to it, by means of a band. The other rollers are  
 merely rotated by the teeth of the rake as it is drawn over them  
 by the attendant. To assist the discharge of the crop there-  
 from, the last roller may have ribs or projections thereon.

Also the "separator" at the side in front of the cutter is of steel, and is jointed to allow it to rise and fall over uneven ground.

[Printed, 8d. Drawing.]

A. D. 1855, September 28.—No. 2159.

DYKE, THOMAS.—(*Provisional protection only.*)—"Grass cutting machines."

The invention "comprises a frame carrying angular-shaped cutting blades" "attached to a longitudinal bar forming the front of the frame." "Each fixed cutter is intersected at its base by a cutter, moveable on a pivot, and these are connected, by arms and pivots, with a suitable bar, worked from about its centre by an elongated arm of one cutter, jointed to a connecting rod operated by a crank." The cutters "cut on both sides with square edges, and in such manner that only one point of that square edge shall at the same time bear on the square lower edge of the fixed angular teeth or cutters." The arms of the moveable cutters may be bent upwards, so that the bar attached thereto is kept clear of the ground. This bar is "of sufficient weight to keep the cutters in contact with the fixed teeth. These latter are prevented from running into uneven ground by" "thickening the under side of the point." "From the base of the teeth backwards" there is "a sheet of iron to receive the cut grass, which is then swept over it by a revolving rake."

[Printed, 4d. No Drawings.]

A. D. 1855, October 5.—No. 2224.

HALKETT, PETER ALEXANDER.—"Improvements in the application of motive power to, and in obtaining locomotion for, the cultivation of land."

The invention consists in laying down sets of rails across a field on which a platform travels being impelled by a steam-engine mounted thereon and winding up a rope or actuating a spur wheel gearing with a fixed rack or otherwise communicating motion to the platform. The platform may also be drawn by an engine stationed at the side of the field, or in some instances by horses. There are also cross rails along the headlands, for enabling the platform to be transferred from one set of rails to another. To the platform implements of any kind

can be attached in any suitable number. These are carried by cross bars below or behind the platform or otherwise ; thus,—

1. A number of ploughs may be thus connected. Certain of these may be arranged to operate in one direction, and the rest in the opposite direction, during the return of the machine. They may be raised or lowered by segmental racks.

2. Drills may be attached to the apparatus. The wheels on one side of the platform may " have sufficient play from side " to side between the bearings to allow for any inequality in " the gauge of the rails," while those on the other side have not such play, and thus the distances apart for the drills may be measured from the rail on the latter side.

3. Hoes or stirrers may be set in sliding sockets on bars behind the apparatus.

4. For working in high crops, a " shield," or double wedge-shaped plate, is fitted in front of each cultivating implement, to divide the crop in front of it.

5. A " rotary or Norwegian harrow," attached behind the platform, may receive motion from the prime mover.

6. A water tank with distributing pipes, for supplying water or liquid manure to growing crops, may be carried on the platform. The manure may be supplied through a hollow bar also acting as a stirrer, so that the manure may be applied below the surface.

7. A reaping machine connected to the platform may be driven by the prime mover. Two reaping machines, working on opposite sides, may be thus mounted.

8. A rake for collecting cut crops may be attached behind the platform, suitable mechanism being applied for tilting the rake at intervals.

Besides the above, any other suitable implements may be attached to the apparatus. Different implements may be attached to the platform at the same time, so as to act upon separate strips of ground.

[Printed, in 62. Drawings.]

A. D. 1855, November 3.—No. 2462.

ROBERTSON, WILLIAM, and HENRY, JAMES.—" Machinery " for reaping and mowing corn."

A toothed ring on one of the running wheels drives a pinion which gives motion to a crank shaft. This, by means of a con-

necting rod, works a short rack and this drives the cutter, which is a "long thin serrated blade," working or not between fingers, and "set at a slight angle to the machine, and suspended from a pair of slings, to one of which the said motion is communicated." By means of these "slings" the angle at which the cutter is set across the machine can be varied. The arms which carry the reel in front of the machine can be raised or lowered. There are side plates beside the cutter "bent or shaped somewhat in the shape of a "turn-furrow" of a plough." These are intended to guide the cut crop, and cause it to fall regularly below the machine and clear of the running wheels. The frame is mounted on a pair of small wheels in front, "capable of being turned on a swivel by means of a lever" acting on a plate through a slot in which the axle passes, in order to guide the machine. "On the periphery of the driving wheels are a series of moveable projections or metal points, which may be thrust out or drawn in by means of bars on the spokes of the wheels acted upon by a set of links, fitted to a ring secured to the nave of each wheel, such ring being moved by a lever." At the back of the apparatus is a platform, on which a "small portable engine" may be fitted when the machine is to be driven by power.

[Printed, 10d. Drawing.]

A. D. 1855, November 9.—No. 2521.

RAYWOOD, JOHN.—"Rolling, dibbling, sowing, and harrowing machine for wheat and other agricultural produce."

The frame of the machine is supported by a pair of large running wheels at the middle of its length, and is also furnished with a pair of small wheels in advance of the former. Two wheels or drums are mounted in the frame, one before and the other behind the axle of the large running wheels; and round each drum passes an endless chain of wooden or metallic links, carrying a series of dibbles. As the machine moves onward, the endless chain travels round the two drums, and the dibbles are pressed into the earth by the foremost drum and raised by the other drum. The dibbles may be constructed so as to turn in the ground, by having screws formed on their stems, in order to make a clean hole. To clear the dibbles from earth there is an elastic steel band fitting over the dibbles, "which band being slack has a constant tendency to force

" itself from the links, thereby clearing off any earth sticking to them." A notched plate is also fitted so that the dibble-points may pass through the notches and be cleared. At the front end of the frame there is a hollow roller for depositing lime, dry ashes, sand, or other dry material, as guano, manure, &c., which is to be spread upon the land when required to prevent the dibbles clogging. Behind the second drum there is a seed-depositing apparatus, consisting of a series of wheels with recesses in their rims. These rotate in a case with an opening above and below. Seed falls from a hopper above into the recesses, and is by them carried round till it comes opposite the lower hole, where it is discharged into the hole made by the dibble. This apparatus is followed by hoes and rakes or harrows, attached to the rear end of the frame. The axles of the running wheels are fitted with springs to prevent jolting.

[Printed, 8d. Drawing.]

A.D. 1855, November 13. — No. 2557.

MURDOCH, ROBERT. — "Improvements in agricultural apparatus for sowing seeds and depositing manure." "The main feature of the improvements is the use of glass chambers or vessels for containing the seed to be sown," whether turnip, clover, cereal, or other seed, "or the manure to be deposited." "This improvement is applicable to all kinds of sowing machines at present in use, and may be carried out by making the seed or manure containing vessel either wholly or partially of glass." One modification of the improvements is represented in the drawings as applied to a turnip drill, which is adapted for sowing two ridges at the same time, and wherein the seed sowing frame, carried on the spindle of two light wheels, is preceded by, and connected by chains to, a frame, carrying the shafts, and also the spindles of a pair of curved rollers to press down the ridges. Two seed containers, consisting of "oblong, cylindrical, or globular" vessels of glass, "by preference of the description known as 'crystal,'" are mounted on a horizontal spindle, resting, by means of journals outside the seed vessels, upon brackets attached to the framing, and deriving rotatory motion from the running wheels. These glass vessels, which "are provided with apertures at which to introduce the seed, and which

"are closed whilst the machine is at work," are perforated  
"with a ring of holes," "passing round them at their longitudinal central portions, and serving for the egress of the  
"seed as the vessels rotate." Underneath each seed vessel  
is placed a trough, supported by brackets upon the framing,  
and divided by a partition, rising up to the side of the said  
vessel, and reaching it at a point about forty-five degrees of  
the circle from its bottom. The seed, as the machine proceeds,  
is discharged from the seed vessels so as to fall to the back  
of the said partition in the respective troughs, whence it  
"passes down guide tubes which deposit it in the earth, and  
"which may either be of the ordinary kind, or they may be  
"made wholly or partially of glass." The sowing of the seed  
can be stopped whilst the seed vessels are in motion by lifting  
the handles of the seed sowing frame, and raising therewith  
the troughs, so as to bring their respective partitions above  
or behind the point at which the seed is ejected from the seed  
vessels, whereby the seed is caused to fall into the space in  
each trough in front of the partition, whence it cannot pass  
to the ground. Rakes, connected to the hinder part of the  
seed sowing frame, cover the seed after the latter has been  
deposited in the ground. "The seed vessels being made of  
"glass in this manner, the attendant will have no difficulty  
"in seeing that his machine is always performing its work  
"in a proper manner." The inventor does not confine himself  
to the precise details, as above described, as many variations  
may be made therefrom without deviating from the  
principles of the invention, but what he claims as his invention  
is,—

"First, the application and use in machinery or apparatus  
"for sowing seed and depositing manure of vessels wholly or  
"partially formed of glass to contain the seed or manure."  
"Second, the system or mode of constructing apparatus or  
"machinery for sowing seed and depositing manure with seed  
"or manure containing vessels, ducts, or spouts of glass."

[Printed, 10d. Drawing.]

A.D. 1855, November 23.—No. 2641.

LACY, AUGUSTUS DACE,—"Apparatus for agricultural purposes, to be used in connection with stationary steam power."



This invention consists, first, in a mode of constructing a trenching plough; and, secondly, in a method of working such plough or other agricultural implements by steam or other motive power. "The plough is constructed with a strong frame of iron or other material, on which are fixed two sets of ploughshares, so arranged as that one set may be made to operate upon the ground in the forward and the other in the backward motion of the plough. These ploughshares are also formed and arranged so as to cut the ground into furrows in the form of steps, and to throw the soil over as the plough proceeds. There are also two sets of coulters fixed in the frame, adapted as to their position and depth to the ploughshares, so as to give the several vertical cuts to the ground at the depth at which the steps will be formed by the shares following in the previous line of the said coulters." There is a large coulters which always precedes the other coulters and is called the "tell-tale coulters, as on it must fall whatever obstruction may occur." "At each end of the plough there is a mode of attachment which disconnects itself from the motive power whenever the coulters is obstructed beyond a certain extent." This is effected by means of springs which let go the rope whenever the strain exceeds a certain amount. The connection may be again formed by the attendant winding on a windlass round which is coiled a small rope attached to the traction rope. The plough is fixed at the upper part of its frame to the underside of a plate, which forms a kind of platform for the attendant. To this plate may be fixed other kinds of agricultural implements in substitution for this plough, such as a surface plough, harrow, seed-drills, reaping machine, &c. "The connection with the motive-power is formed at each end of the said plate by means of wire ropes or other suitable material or means; one rope being passed over or partially round a pulley, and round a barrel worked by one stationary engine, and the other rope being passed over a similar pulley, and round a barrel worked by another stationary engine, one barrel winding while the other is unwinding its rope. The said pulleys are respectively mounted on rails properly supported, so as to admit of their being shifted as required for working the agricultural implement over the different parts of the land."

A.D. 1855, November 28.—No. 2656.

JONQUET, DENIS.—Blades of mechanical cutting machines.

Part of the invention refers to reaping machines, and consists in the use of "notched blades" therein, actuated in various ways. The following modifications are shewn in the drawing:—

1. The cutter consists of a pair of sickle shaped blades or teeth on a rotating disc. A row of these is fitted in the usual position with fingers between them. The cutters are driven by a train of spur wheels.

2. Curved blades are fitted on an endless chain travelling across the machine.

3. Blades with deep angular notches in the side reciprocate across the machine.

4. Crescent shaped blades terminating broad blades or plates are pivotted to a bar, and have a vibrating motion given them from a bar behind.

The other portions of the reaping machines are of the usual character.

To explain properly the precise shapes of the cutting blades, figures would be required.

[Printed, 1857. Drawings.]

A.D. 1855, December 7.—No. 2766.

WILLIAMS, JOHN ALVIN.—"Apparatus for cultivating land."

The invention relates to the "construction and arrangement of implements and framework for carrying the same for cultivating land; such implements answering, by slight modifications and adaptations, as scarifiers or grabbers, rafter ploughs, horse hoes, and drags." The implements are carried in a frame running on a pair of small swivel or guide wheels in front, and upon a pair of larger wheels at the rear. The beams of the implements slide at each end on vertical guide bars, and are raised or lowered at each end simultaneously by means of chains, connected to a roller which is turned by cross lever handles. "Each implement may be raised separately at the back end by a handle, attached thereto for that purpose,—the beams being jointed to vertical sliding blocks at the front end of the machine."

"When the machine is used as a scarifier or grubber, common plough bodies are employed, with land sides and

" coulters attached, and having the ordinary point used for  
 " carrying the common ploughshare ; the coulters being used  
 " only when found desirable." The share proposed to be  
 used consists of "an ordinary ploughshare with a left-hand  
 " fin formed upon it. A small turn-furrow of a peculiar  
 " construction is fitted to the plough body, and consists of a  
 " steel plate, fitted or formed with a knife or cutting edge at  
 " right angles or thereabouts to its surface, working under  
 " the furrow and severing the same ; so that one portion of  
 " the furrow slice will be cut and laid over the other part,  
 " thus leaving an uneven surface " for the harrow teeth to  
 lay hold of.

" When used as a rafter plough," the inventor says, " the  
 " 2nd and 4th implements and beams are removed, if 5 are  
 " used, and the common turn-furrow may be attached to the  
 " remaining three plough bodies, and used in the ordinary  
 " manner with the common ploughshare and coulters. If it be  
 " required to use the machine as a horse hoe, I remove the  
 " 2nd and 4th beams as before, and use the ordinary plough  
 " body and coulters in conjunction with the peculiarly formed  
 " double fin ploughshare therein-before described, but having  
 " a rather wider fin, if found desirable, whilst the peculiar  
 " turn-furrow and cutter is dispensed with." " When used  
 " as a drag, the whole of the beams may be used, but the  
 " plough bodies must be removed therefrom, and drag tines  
 " substituted therefor." The machine may be drawn by  
 horses or steam power. " It may also be made with 3 beams ;  
 " and when used as a rafter plough or horse hoe would in  
 " that case require the centre beam to be removed whilst the  
 " outside ones do the work."

[Printed, 10d. Drawing.]

A. D. 1855, December 17.—No. 2848.

EVANS, OMROD COFFEEN.—" Digging machinery."

The machine described is intended for "spading or breaking  
 " up the earth preparatory to planting." It consists of  
 " a truck or cart, supporting a framework in which revolves  
 " a series of drums or broad-faced wheels side by side, each  
 " carrying an endless belt or chain, and upon which a series  
 " of spades or spading forks is placed." As the machine  
 is drawn along, " each spade is driven into the ground gradually

" and in successive order, and so as simply to pierce the  
 " same without breaking in the first instance. The upheaval  
 " or turning of the sod or earth is performed only at the  
 " time of leaving the ground." Each endless chain is kept  
 distended by two pulleys, one before and the other behind  
 the drum, and as the machine advances, the chain travels  
 round the drum and pulleys, each part successively descending  
 to the ground and forming a kind of tramway for the drum,  
 which rolls upon it and forces the spades or forks into the  
 earth. The spades may be of any suitable shape, preferably  
 curved. The frame may be raised by any suitable means,  
 such as a winch handle driving the requisite gear.

[Printed, &c. Drawing.]

A.D. 1855, December 18.—No. 2859.

TOLHAUSEN, ALEXANDER. — (*A communication from  
 Dewitt Clinton Henderson, and Alexander Hamilton Caryl.*)  
 —"Harvesting machine."

The cutter has a reciprocating motion given to it by a  
 friction roller on an arm thereon which fits in a zig-zag groove  
 in the periphery of the single large running wheel. The ends  
 of the cutter bar are carried by "stirrups." A "pressure bar"  
 is fitted along over the cutter teeth, and this can be screwed  
 down to apply any required pressure on the teeth. A rake is  
 fitted to traverse across below the platform on which the cut  
 crop falls, the teeth of the rake projecting up through slots  
 in the platform. This is operated by means of a weighted  
 chain, which is disengaged at intervals, by a lever worked by  
 the attendant. A grooved pulley on the driving shaft is  
 thrown in and out of gear with the shaft to wind up the chain.  
 The weight also is caused to slide along a bar and keep the  
 rake in a position with its teeth upwards during its traverse.

[Printed, &c. Drawing.]

A.D. 1855, December 28.—No. 2940.

BAILY, HENRY GEORGE.—"Machinery for digging and forking  
 "land."

The object of the invention is stated to be to arrange appa-  
 ratus so that "a series of spades or forks, carried by a frame,  
 " shall be caused to descend into the earth, then that each  
 " spade or fork shall act as a lever on its fulcrum to lift its

" clod, and then to turn on its handle or axis to cast the clod  
 " to the right or to the left of the position from which the  
 " clod has been taken." The frame, which is of a rectangular  
 form, is suitably constructed to hold the straight handles of  
 the spades or forks, and to permit them to turn freely at certain  
 times; each handle having a short projecting arm at the  
 lower part, and the several arms being connected by a straight  
 bar, so as to move simultaneously. The spades or forks  
 project in a row from the lower cross bar of the frame, with  
 fixed cutters between them to divide the clods. The requisite  
 motions for forcing the spades or forks into the earth and  
 causing them to lift the clod are imparted to the frame by a  
 steam engine mounted thereupon; and when the frame has  
 nearly assumed a horizontal position, a short arm on one  
 of the handles comes in contact with a fixed stop, and the  
 handles are thereby made to turn and cast off the clods.  
 " The combined machinery is carried by a suitable carriage  
 " on wheels, and provision is made to move such carriage a  
 " proper distance at each time after turning over a clod by  
 " each spade or fork; and this is done by the working of the  
 " steam engine, which gives motion at proper intervals to a  
 " drum, which winds up a longer or shorter length of wire  
 " rope, and at the same time another drum unwinds a like  
 " quantity of another wire rope, according as each of the  
 " spades or forks is to dig or fork up a smaller or larger  
 " clod."

[Printed, 3s. 6d. Drawings.]

1856.

A. D. 1856, January 3.—No. 27.

FWLER, JOHN, junior. — "Machinery for giving motion to  
 " ploughs and other implements."

Two capstans or barrels are mounted on the same base plate  
 or frame, and receive motion from a portable steam engine in  
 such manner that when one of the barrels is being driven  
 to wind on the wire rope used therewith, the other barrel  
 is allowed to run free and to unwind the wire rope. The  
*rope is fastened at its ends to the barrels or capstans, and is*

passed through two guide pulleys, anchored or fixed to the ground opposite to yet distant from each other, and also distant from the two barrels. Ploughs or other implements are attached to the rope at that part which is between the two guide pulleys, so that when the rope is being wound on to one of the barrels and off the other, the implements will be moved in a direction from one guide pulley towards the other, to the distance desired; then when the action of the barrels is reversed, the implements will be moved in the opposite direction; and by varying the position of the two guide pulleys from time to time, the whole surface of the land may be subjected to the action of the ploughs or other implements.

[Printed, 8d. Drawing.]

A.D. 1856, January 4.—No. 31.

HART, CHARLES.—(*Letters patent void for want of Final Specification.*) Portable engines and agricultural machinery.

The first part of the invention relates to the construction of portable or locomotive steam engines, adapted more particularly for agricultural purposes. After describing the general arrangement of the engine, the patentee says, "In order to facilitate the travelling upon soft land, I use a circular endless rail, wider and larger in diameter than the rim of the travelling wheels, fitted with suitable guides for keeping it in its proper position around the travelling wheels."

The second part of the invention consists in furnishing the portable locomotive engine with apparatus for tilling or cultivating land. For this purpose at the lower part of the machine, near to the surface of the ground, is placed an adjustable horizontal shaft, armed with a number of tines or cultivators. As the engine travels over the land, a rotary motion is imparted to the shaft by suitable gearing, and the tines or cultivators are thereby caused to enter and break up the soil.

[Printed, 4d. No Drawings.]

A.D. 1856, January 11.—No. 87.

SMITH, WILLIAM.—"Ploughs and other cultivating implements."



The implements intended are such as are put in motion by steam or other power actuating barrels, on to and off which ropes are wound. The object of the invention is to provide a means of turning the plough, &c., at the end of each course. For this purpose the inventor arranges "the fore part of the plough or other implement in such a manner that the two ends of the ropes used may be both attached to the fore part of the plough or implement, and so that the end of the rope which is next to come into use, as the draft rope of the plough or implement, shall, by the working of the engine or power, first act to turn the plough or implement, and the end of the rope previously acting as the draft rope shall pass from the front as the plough or implement turns into position."

Several forms of "draft apparatus" are shewn, to which the two ropes are to be hooked or otherwise attached. When one rope is hauling, the other rests along the side of the implement, so that as soon as it is hauled on, it tends to turn the plough, &c., round.

"Another improvement consists in applying to such descriptions of ploughs or implements a leg or support, which is ordinarily above the land; but when the plough or implement comes to the end of a course, the leg or support is lowered, so as to come on the land, by which the hinder part of the plough or implement is raised out of the land; and then the plough or implement is turned on the leg or support, so as to come into position for performing a return course." This "leg" is lowered by a rack and pinion or other suitable arrangements.

[Printed, 10d. Drawing.]

A. D. 1856, January 16.—No. 120.

**FOWLER, JOHN, junior.**—"Machinery for ploughing land."

This invention consists, firstly, in working a subsoil or drain plough by combining "an upright or horizontal barrel or capstan on the same frame, platform, or base plate with an engine which gives motion to it, by which capstan or barrel the subsoil plough is moved by a wire rope; and there is a second barrel for moving by another wire rope the engine and capstan from point to point along the headland. The machinery is arranged to make a direct pull on the plough,

"and is therefore moved a distance each time equal to that between drain and drain."

"The second part of the invention relates to the anchor or instrument used for holding on or resisting the movement of the engine, capstan or barrel, and pulleys when working with drain, subsoil, or other ploughs by power. For this purpose a plate or frame is used, which, when employed, is placed upright in a hole. On this plate or frame is hinged a lever, to the upper end of which a chain or rope is fixed. The lower end of this lever is formed with a broad end or plate, which, when the lever is pulled on, rests against the opposite side of the hole, and very securely anchors the engine and machinery which gives motion to the plough, and when pulleys are used, they are similarly anchored."

[Printed, 1s. 4d. Drawings.]

A.D. 1856, January 30.—No. 253.

WILKINSON, THOMAS FEWSTER.—(*Letters Patent void for want of Final Specification.*)—"Reaping and mowing machines."

The invention refers to apparatus for delivering the cut crop from the machine. Under the platform on which the crop falls is a pair of parallel rakes which are traversed backwards and forwards across the machine. The teeth project up through slots in the platform, and during the backward movement they are depressed by a pin striking on a stop, to be erected again for the forward traverse. A single rake may be similarly employed.

To throw the cutting apparatus into gear with the running wheels there is a wheel running loose on the axle, and a sliding clutch which can be thrown into and out of gear therewith.

[Printed, 4d. No Drawings.]

A.D. 1856, February 5.—No. 313.

HOWARD, JAMES.—"Apparatus for making moulds for castings."

The apparatus described is stated to be particularly applicable to "the moulding of articles having interstitial vacuities, as for example, wheels with radial arms and plough and

"other frames." The pattern is mounted on a table, which is capable of receiving a "steady vertical motion" by any suitable apparatus. The bottom of the flask is composed of a plate "like a stencil plate," shaped "so as to present the" counterpart figure of the pattern." The pattern is raised into the flask through the open "moulding plate;" the flask is filled with sand, which is rammed in the ordinary manner; the pattern is then lowered, and the moulding plate supports the sand. Any detached parts of this plate are supported by "pillars or connecting pieces."

(Printed, 1s. 6d. Drawings.)

A.D. 1856, February 20.—No. 431.

FREER, JOHN.—"Improvements in machines for planting grain and seed, and an improved seed feeder and meter for planting machines," "adapted to steam, horse, or manual power." The planting is effected by means of one or more planter wheels, having round the circumference a single row of planters, or, as preferred by the inventor, each wheel may be divided into two parts, forming a double wheel, and "each" part having its series of planters round the circumference." Each planter wheel revolves in bearings fixed to a framework, consisting of "a horizontal bar on each side of the wheel, and" "a circular bar in the middle of the wheel between the two" rows of planters;" on the top of the circular frame are placed seed hoppers and a seed measurer. "The frames of the planting wheels are fixed in a main framework at regular distances" apart." "A roller is placed at the back of the frame, to" raise the planter wheels clear of the ground when the machine is travelling from field to field." Each planter is made with two tongues, one fixed, the other moveable, having a piston between them. The fixed tongue is bent so as to form an angle about midway of the length of the planter; the moveable tongue works on a centre, and has its inner end forced outwards by means of a spring on the piston shaft, so that, when the piston is drawn inwards, the outer end of the tongue is brought against the outer end of the fixed tongue, and the point or orifice of the planter thereby closed. The pistons on opposite sides of the planter wheel are connected in pairs by rods extending across the centre of the wheel, and are

actuated during the revolution of the wheel by means of arms attached, one at right angles to each piston, and passing through a groove in the side of the planter, coming respectively "in contact with a slide, which at the proper moment " forces the piston up and opens a planter on one side, while " the piston of the planter exactly opposite is forced down and " closes that planter." Instead of a slide, a cog wheel, mounted on a shaft fixed to the planter frame, or, in case of a double wheel, to each side thereof, and actuated by pins or pegs round the circumference of the wheel, may be employed to give motion to the piston arms. Open cells or chambers for holding seed, which is supplied from the seed hopper through shoots, one shoot to each set of planters, or to each side of the double wheel, are cast one in the side of each planter, and fitted round with a circular or conical casing, which is formed with an opening for the shoot, and is secured to the planter frame. The casing being stationary, each cell, during the rotation of the wheel, is successively supplied with seed, which is pushed through the orifice of the planter by the piston. "Scrapers " for cleaning the sides and points of the planters are fixed on " the hoop between the sides of the wheel," or the same may be mounted on arms, attached one on each side of the axle of the planter wheel, and a presser wheel or grooved wedge fixed to the outer end of the arm beyond the scrapers, for the purpose of filling in the holes made by the planters; "pulleys " may also be affixed for carrying sets of blocks connected by " endless chains for cleaning the spaces between the planters." When on the pulleys the blocks are nearly side by side, but on " the rising side the sets are separated by a wedge, which " forces them between the spaces of the rising planters." The rotation of the top pulley may be employed to give motion to the seed meter or measurer, which consists of a circular plate, pierced with cups or holes near its outer edge, and rotating upon a fixed smooth plate, having an opening on each side of the planter wheel to allow the seed to fall into the shoot. " When turning at 'land's end,' the shoots are closed by " means of slides, and the seeds, instead of entering the " planters, fall into a box provided to prevent waste. A circular hopper surrounds the top side of the meter, which is " supplied with seed, except at the delivering points, where " the meter is kept clear of seed to a certain extent by means

" of partitions or guides curved inwards, which prevents any  
 " seed from being drawn from the hopper, except that which  
 " has sunk in the holes of the measurer. The partitions  
 " over the holes are fixed by springs, so that when they are  
 " filled to excess the seed may pass without injury. A small  
 " wheel is placed within the guides, with pins or points on the  
 " circumference, which enter the holes of the measurer, pick  
 " out the seed, and drop it at the proper time. Rotary motion  
 " is imparted to the meter by a hollow boss, through which  
 " passes an upright or standard, made fast to the frame," and  
 " upon which is fixed a circular plate, forming the bottom of the  
 " reserve seed hopper. " When closed, the hopper rests upon  
 " the fixed bottom before mentioned, but when open it is lifted  
 " from the bottom by means of a screw on the top of the up-  
 " right or standard, and the seed rushes out all round into the  
 " lower hopper. The higher the hopper is raised from the  
 " fixed bottom, the deeper will the lower hopper be filled with  
 " seed." Another arrangement of seed meter consists of cups  
 " on an endless chain, passing round an upper and a lower chain  
 " wheel, the former of which is driven by a connecting rod on a  
 " crank on the axle of the cog wheel which actuates the piston  
 " arms. On the bottom of the planter frame is placed a guard,  
 " which can be raised or lowered by means of a screw, for regu-  
 " lating the depth to which the planters shall descend into the  
 " soil.

[Printed, 1s. Drawing.]

A. D. 1856, February 23.—No. 462.

BOYD, JAMES EDWARD.—Scythes.

" The heel or tang of the 'scythe' instead of being sent out  
 " of the factory bent at right angles" is bent to "a certain  
 " angle or angles, according to a graduated scale; each such  
 " angle is known by a particular number or name, for instance,  
 " angle No. 1 may be calculated to suit a man 5 feet in height,  
 " angle No. 2 to suit a man 5 feet 1 or 2 inches in height; and  
 " so forth, altering the number of the angle according to the  
 " height of the man." The scythe is attached to an ordinary  
 " scythe handle, or to one with "a double joint fastened by bolts  
 " and nuts, which being adjusted by a wrench or key or other  
 " instrument, facilitates its being put and firmly fixed into any  
 " required shape or position." "The lower joint of this

“ handle enables the plane of the blade to be adjusted ” so  
 “ that its cutting edge shall be higher, lower, or on a level  
 “ with the back of the blade. The upper joint regulates the  
 “ angular distance between the handle and point of the scythe,”  
 Also the tang may be made “ with a more malleable and softer  
 “ description of metal than that at present used.”

[Printed, 4d. No Drawings.]

A.D. 1856, February 28.—No. 512.

FOWLER, JOHN, junior, and GREIG, DAVID.—“ Ploughing  
 “ and tilling land.”

“ This invention has for its object improvements in plough-  
 “ ing and tilling land when steam power is employed. For  
 “ this purpose several ploughs or tilling instruments are placed  
 “ at each end of a frame, in order that when the implements  
 “ at one end of the frame go out of work, the implements at  
 “ the other end of the frame may come into action ; the frame  
 “ is mounted on an axle in the middle, and moves thereon as  
 “ on a fulcrum. The machine has two or more wheels to run  
 “ on, and is moved to and fro across the land by means of wire  
 “ ropes, put into motion by a barrel or barrels caused to rotate  
 “ by a steam engine. By this arrangement, when the machine  
 “ arrives at the end of its course in one direction, in place of  
 “ having to turn it round, one set of implements go up out of  
 “ action, and the other set of implements descend and come  
 “ into action ; and this is effected by the draft of the wire rope  
 “ taking place in the opposite direction.” Besides the pair of  
 wheels at the centre, there is another wheel which is moveable  
 and can be placed at either end of the frame, as it comes into  
 work.

[Printed, 10d. Drawing.]

A.D. 1856, March 11.—No. 588.

COLLINS, JOHN.—(*Provisional protection only.*)—“ A ma-  
 “ chine for pulverizing, crushing, pressing, and cleaning land.”  
 The invention consists, firstly, in “ the application of one, two,  
 “ or more cylinders, of a ribbed or corrugated form and sur-  
 “ face, the same to be placed on a horizontal shaft or spindle,  
 “ and to move round the same.”

Secondly, in “ the application of certain rings or discs, to be  
 “ coupled or bolted together by a number of bars or rods, so



"as to form one continuous cylinder or barrel, such rings or  
 "disks to have ribs, tines, or other projections of metal, the  
 "said rings or disks to be of any convenient or required  
 "number."

Thirdly, in "the application of certain rails, bars, or other  
 "projections for cleaning the said rings, disks, cylinders, or  
 "barrels."

Fourthly, in "the application of metal tines or rakes, for the  
 "purposes of moving and cleaning the land, such tines or  
 "rakes to be placed in the front of any rings, disks, cylinders,  
 "or barrels, as herein provided, or to follow the same."

[Printed, *ad.* Drawing.]

A.D. 1856, March 25.—No. 712.

COLLINS, ROBERT.—"An improved agricultural implement."  
 The invention, which consists in "adapting one machine or  
 "implement to four distinct uses, namely, as a 'scarifier,' a  
 "'conch rake,' a 'skim plough,' and a 'turnip hoe,' is thus  
 "described by the inventor:—I so construct a light iron  
 "framework as that the sides thereof are capable of being  
 "adjusted nearer together or further apart, as also land  
 "wheels and shafts; and according to the purpose for which  
 "I require the machine, in like manner I adapt thereto suit-  
 "able implements of the ordinary kind; for example, if  
 "required for a scarifier, or a skim plough, I adapt thereto  
 "upon adjustable rods implements such as are commonly  
 "used for such purposes, and this applies also to the conch  
 "rake and turnip hoe above mentioned." The adjustable  
 side framings which are connected by universal joints to a  
 front or splinter bar, to which the wheels are adjusted, ter-  
 minate in handles, which are employed for raising or lowering  
 the tines, or other instruments used,

[Printed, *ad.* Drawing.]

A.D. 1856, April 22.—No. 962.

SMITH, WILLIAM.—(*Letters Patent void for want of Final  
 Specification.*)—"Improvements in constructing and applying  
 "windlasses for working ploughs and other agricultural im-  
 "plements." "The barrels of the windlass are mounted in  
 "a carriage, which, by preference, travels on two wheels, and  
 "is constructed with shafts to receive a horse. Two barrels

“are used, which are capable of turning independently of each other freely on the axle of the carriage; each of the barrels has fixed thereto a cog wheel, and the one or other barrel will be caused to rotate according as the pinion on another axis is slid into gear with one or other of the two cog wheels. The pinion axis receives motion by a cog wheel thereon, being driven by another cog wheel on an axis, which receives its motion from a steam engine, which is on a separate carriage.”

(Printed, &c. No Drawings.)

A.D. 1856, April 23.—No. 973.

SAVAGE, WILLIAM PEACOCK. —“A machine for drilling and rolling land.” The invention “consists in adapting to an axle shaft or axis, travelling on wheels and guided by a front steering wheel, worked from behind, discs or wheels, wedge-shaped at their circumference or outer edge, with scrapers, seed box, hollow coulter, harrow, and other suitable implements for depositing the seed in a solid seed bed, covering it over, and rolling the land.” The discs or wheels employed are of two kinds, “revolving coulters,” which are the larger in diameter, and fit close to the axis, and “angle press wheels,” which fit loose on the axis, and two of which, when drilling and rolling light land, are placed on each side of each revolving coulter. Collars or stops, each of which is provided with a screw, are “adopted so as to be fixed to the axis and keep all the wheels in their proper position, that is, working at right angles to the axis;” small loose stops are also provided “for filling up the space when fewer wheels than in the entire machine are used;” and larger stops or wheels are “employed between the larger discs, for the purpose of keeping them in their proper position.” The axis revolves in a boss at the angle or centre of a main stay, placed on the middle of the axis; this “middle stay,” together with the collars or “stops for insuring the proper position and working of the discs” “are some of the essential parts of the invention.” Any desired arrangement of the revolving coulters and angle press wheels on the axis may be made, to suit the kind of work required to be done. The seed is expelled from the seed box in the ordinary way by means of cups, having each “an angular shank with the sharp edge upwards;” it thence

descends through tin hoppers, and spouts, into the hollow coulters, which are placed behind the revolving coulters, and have a harrow or projection on either side for covering the seed. The seed may be either "dropped," or "strewed," from the hollow coulters; if dropped, the chaps or mouths of the coulters are opened by means of a suitable mechanical arrangement, and are closed again by a spring after the seed is deposited; if strewed, "the lids at the mouths of the hollow coulters, to which the spring is attached, are kept open, by a hook on each side of the machine." The seed box can be lifted out of gear by means of a lever.

[Printed, 10d. Drawings.]

A.D. 1856, April 26. —No. 999.

LAWES, THOMAS. — (*Provisional protection only.*) — "Implement used in tilling the land."

The invention refers to a digging machine and consists in a method of raising and lowering the digging cylinder with its tines, &c. This is stated to be effected by keying an eccentric wheel on the cylinder, so that by turning the wheel one way the cylinder is lowered, and by turning it the other it is raised. The object of thus raising the digging cylinder is to enable the machine to turn round. For travelling, additional pieces are fitted on the eccentric wheel to make it circular.

[Printed, 4d. No Drawings.]

A.D. 1856, May 1. —No. 1032.

CAREY, STEPHEN. — "Improvements in water carts and barrows."

The improvements consist in inserting telescopic tubes, perforated with holes, or flexible hose, or branch pipes attached by universal joints, at the ends of a main or distributing tube, fixed horizontally at the back of a water cart or barrow, so as to distribute water, or any substance dissolved or suspended in water, over a wider space than is now done in the ordinary way. Another improvement consists in making in all or any of the above-named tubes, hose, or branch pipes, "two or more rows of perforations or jets, apart from but parallel to each other;" or, if desired, slots may be made lengthways in the same; or roses or perforated T pieces may be fixed underneath,

or at the ends of, all or any of the said pipes or tubes. The several contrivances for distributing liquid may be attached to the sides of the cart, by junction pieces from a valve hole in the bottom of the same. The valve used for covering the hole or holes at the bottom of the water cart or barrow is simply a piece of leather, having a board and weight upon it, and is made to act as a hinged flap; other valves may, however, be used. For irrigating wide spaces, perforated "tubes, trunks, or troughs," may have "a series of small "trays or boxes" suspended to their under sides, for the purpose of allowing the removal of thick substances from the liquid; or, instead of the boxes and trays, under each of the perforations may be suspended "a cone, made of corrugated iron, zinc, or gutta percha, upon the apex of which "the water or liquid manure descends;" or plain boards may be fixed under the perforations. Another improvement consists in placing to the inside, and over the surface of the cart, floats or frames, composed of cocoa-nut fibre, coarse canvas, perforated zinc, or wire gauze, for the purpose of preventing splashing, and of separating any thick substance that may be contained in the liquid when it is put into the cart; or plain boards may be used simply to prevent the splashing. "The "improvements also relate to the carrying of the body of the "water cart upon high wheels, either with or without one or "more front or guide wheels, the latter being made small "enough to pass under the fore part of the body to enable "the cart to turn easily," The axle may be enclosed in a water-tight pipe, and pass through the body of the cart, or it may be cranked under or over, or both under and over, to allow of the application of springs; or the body of the cart may be made in two parts, connected by tubes or hose, and having the axle passing between them.

[Printed, &c. No Drawings.]

A.D. 1856, May 1.—No. 1036.

SMITH, NATHANIEL.—"Improvements in clod-crushing rollers, parts of which are applicable to other descriptions of rollers."

The invention consists, firstly, "in the construction of a "clod-crushing roller, composed of one, two, or more cylin-

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" ders, with knibs or projections upon the face thereof. The  
 " projections are in the form of a cone, or of a cone with a  
 " channel or groove, or in any other suitable form which will  
 " simply crush or crumble clods of earth without cutting the  
 " land." The roller may be composed of a number of cylinders placed closely together on an axle, or the whole may be formed in one piece; or, by a modification of the arrangement, a number of axles, having their bearings in two discs or wheels, may be placed round the centre axle, and have wheels, discs, rings, or cylinders, having "knibs or projections" on their faces, or otherwise, mounted upon them; such rings work alternately between each other, and are kept at a suitable distance apart by means of collars or washers. Some of the cylinders or rings may be made with teeth and placed on each axle alternately with smooth-faced rings, or rows of toothed rings may alternate with rows of smooth rings.

" Secondly, in casting a wheel or spokes and boss on to  
 " hollow rollers for the reception of an axle, and in forming  
 " one or more of the spokes and the boss hollow, or with an  
 " aperture therein, for the purpose of containing a supply of  
 " grease or other lubricating material." The inventor applies  
 " these hollow spokes and bosses to all descriptions of rollers,"  
 and finds them "especially useful for cylinders having smooth  
 " surfaces for the rolling of grass land."

" And, thirdly, in jointing the axle of rollers in such manner  
 " as to allow of independent rising and falling motions to the  
 " sections, all or some of them, of which the roller may be  
 " composed;" the mode of effecting this, however, is not  
 specified.

[Printed, &c. Drawing.]

A.D. 1866, May 2.—No. 1043.

DAY, WILLIAM.—(*Provisional protection only.*)—"Improve-  
 " ments in clod-crushers or rollers for rolling, pulverising, or  
 " pressing land." "My improvements," the inventor says,  
 " enable a single axle roller to combine the advantages of  
 " deep crushing with fine surface pulverisation, and also con-  
 " tains an abrading or clod-grinding action together with the  
 " self-cleaning motion of each alternate roller part."  
 " My improvements consist in making use of narrow-edged  
 " discs, parts, or cylinders," which may be serrated or other-

wire, and "so arranged as to work side by side with other "broad-faced cylinders, parts, or discs," having centre holes larger than the others, "upon the same shaft or axle."

[Printed, 4d. No Drawings.]

A. D. 1856, May 2.—No. 1048.

THOMPSON, HENRY ATWOOD.—"Hay-making machines."

1. Instead of the bearing wheels running free with a hollow nave on an axle projecting from the framework of the machine, the running wheels and the spur-wheel which drives the fork cylinder are keyed on the axle.

2. Moveable bearings, which can be replaced when worn out, are fitted in the framework of the machine.

3. The tines are double, having a curved projecting point at the back, so that the curved point may serve to lift the hay, and the straighter point may throw it off.

4. The "side frames from the shafts" are attached to the outside of the gear boxes, by having a ring formed on the ends which fits over a projecting part of the box.

[Printed, 10d. Drawing.]

A. D. 1856, May 2.—No. 1049.

CAMPBELL, ROBERT TOLME.—(*A communication.*)—"Machines for reaping and mowing."

The draught pole is attached to a "draught wheel," fitted in a ring turning in another ring which is attached to the machine by means of a pair of racks, and by these the cutters can be raised and lowered. The cutter bar is held down by springs with rollers on their ends. The "teeth" (fingers) are "in two pieces, an upper and an under piece" with a strip of leather between against which the cutters strike as they reciprocate. The cutters are driven in "the usual way, by "gearing from the main driving wheel" on the rim of which to give it hold on the ground there are "two rows of angular "zig-zag flanges or projections, the points of the angles being "just far enough apart to allow a tooth or clearer to pass "between them." The corn is formed into sheaves by a reciprocating "compressor" acting against two fixed "compressors." These are of such shape as to grasp the corn between them and are placed behind the cutters so as to receive the corn therefrom. The "reciprocating compressor



" moves latterly back and forth in guides between the station-  
 " ary ones, and at right angles to the path of the machine."  
 This motion is derived from a cam-groove and lever on the  
 face of the driving wheel, throwing one or other of a pair of  
 pinions in gear with a spur wheel on the driving shaft. The  
 guides in which the "compressor" works are adjustable. It  
 is held in position by a catch while the sheaf is bound by  
 hand.

[Printed, 8d. Drawing.]

A.D. 1856, May 6.—No. 1067.

HUCKVALE, THOMAS.—"Improvements in implements for  
 " thinning and hoeing turnips and other crops." In the  
 improved machine, which may be worked either by horse or  
 manual power, "cutters or thinners" are arranged, so as to  
 be capable of adjustment, upon the periphery of a disc, which  
 is fixed on an axis, one end of which forms an angle with, and  
 derives rotary motion through gearing from, the axle on which  
 the travelling wheels are fixed in the fore part of the framing,  
 whilst the other end is supported in a cup bearing carried by  
 the framing, whereby the angle of the axis may be varied.  
 The disc, with the cutters, during the onward progress of the  
 implement along a row of plants, is thus caused to act ob-  
 liquely across the row, whereby the cutters, which "are pointed  
 " at their ends, and bent forwards in such manner as to pass  
 " into the earth," act in succession, and "remove the plant  
 " or plants of a row of turnips or other crop." The depth of  
 cut is regulated by the adjustment of two wheels, carried by  
 vertical bars at the hinder part of the frame. Two rows of  
 plants may be hoed at the same time, by combining two frames  
 in the same carriage, by means of a bar, which passes through  
 openings in the frames, and admits of their rising and falling  
 independently of each other; the distance between the frames  
 being regulated by adjustable stops, which slide upon the bar.  
 To prevent the hoe sliding on the side of a hill, the axes of the  
 wheels are united by rods, and have direction given to them  
 by a lever or "two rudders," consisting of flat pieces of iron  
 which pass edgewise through the soil, may be fixed by their  
 stems in fastenings on the frame, and have direction given to  
 them by a lever. The stems of the hoes are cleaned by de-  
 pressing a handle in connection with a bent piece of iron or

wood, working on a pivot; "or revolving prongs, put in motion by a band, may be used; or a revolving piece of iron or wood, working in front or on one side of the stem, and kept in motion by a band, may be used."

[Printed, 19d. Drawings.]

A.D. 1856, May 12.—No. 1114.

CLAUS, CHARLES FREDERICK.—(*Provisional protection only*).—"Moistening of land, streets," &c.

The following is the whole Provisional Specification:—

"I employ, instead of water, *chloride of calcium*, or solutions thereof, or substances containing the same; or also chloride of magnesium, or solutions thereof, and apply them to land, streets, or to fires, in the same manner as water has been or may be applied."

[Printed, 4d. No Drawings.]

A.D. 1856, May 14.—No. 1145.

EVANS, WILLIAM.—"An improved description of plough." The invention relates to a paring plough, or "parer," adapted for the same use for which a breast plough is now employed. The working parts are carried by a framing, mounted on two fore wheels, a land wheel, and a guide wheel, and a third wheel at the tail of the plough. The peculiar features of novelty are as follows:—

"First, the 'share' of the implement" "has a 'coulter' on the land side thereof."

"Second, the point of the said share is placed as far forward as the centre of the two fore wheels."

"Third, the turn-furrow springs immediately from the point of the share, and is of such shape as to leave the furrow hollow on the ground, in the form of a half tube, for drying, instead of leaving the furrow flat, as is now the case with ordinary ploughs and breast ploughs." "This mode of forming the turn-furrow applies to ploughs generally."

"Fourth, both the arm which holds the share and the under edge of the 'turn-furrow' are arched, so as to run clear of the ground from the edge of share to the heel or tail of the 'parer,' and such arching serves also to prevent them being thrown out of the ground upon coming into contact with

" a stone, and also prevents choking by an accumulation of  
" conch, stubble, or rubbish."

A scraper, connected by a rod to a crank fixed upon the axle  
of the hind wheels, is provided for cleaning the broad share.  
The implement " may be readily and easily converted into an  
" ordinary plough."

[Printed, &c. Drawing.]

A.D. 1856, May 15.—No. 1153.

WILLIAMS, CHARLES RICHARD.—" Apparatus for the culti-  
" vation of land."

This invention consists of an apparatus in which a series of  
prongs or blades is so connected with the wheels of a support-  
ing frame or carriage that as the carriage is drawn along, the  
prongs are " made to descend into, and rise from the ground  
" by a motion somewhat resembling that of digging." The  
prongs are arranged in two rows across the frame. The upper  
end of each prong is straight, and the lower end is curved nearly  
into a semi-circular form, so as to somewhat resemble a reap-  
ing-hook with a long handle. The prongs of each row are  
pointed at the top to short levers, which play upon a fixed bar  
that extends horizontally across the machine, and at the middle  
they are jointed to arms, projecting from clips or metal bands  
which encircle a corresponding number of eccentrics, keyed  
upon a horizontal shaft driven by gearing from the running  
wheels. " The lower pointed and curved ends of the prongs  
" descend successively into the ground, each of the said prongs  
" or blades having an advancing as well as a descending  
" motion; after having attained the maximum depth, the  
" prongs or blades commence an ascending motion; the prongs  
" or blades again enter the ground at or near the place where  
" they left it."

[Printed, &c. Drawing.]

A.D. 1856, May 15.—No. 1156.

MARYCHURCH, WILLIAM, and GRIFFITHS, JOHN. —  
" Improvements in horse rakes, part of which is applicable  
" to two wheel carriages." One part of the invention relates to  
" the construction of horse rakes in such manner that the teeth  
" may be raised to discharge their load, and lowered by the

"forward motion of the implement." The teeth of the horse rake are hung upon an iron bar, which is fitted into the two sides of the frame at its fore part, and revolves on its own axis; it is connected to a hinder bar for raising the teeth, by means of cranks inside the frame, and extends a little beyond the frame on one side, in order to have attached to it another crank, which serves as a fulcrum, outside the frame, to a lever, actuated, when thrown into gear, by one or more tongues thereon falling into one or more teeth of a ratchet wheel, revolving with the driving wheels, whereby the teeth are raised by the forward movement of the implement; "when in this position, the back of the next tooth in the ratchet wheel to that in which the tongue or last of the tongues of the lever was engaged presses against a curved projection on the lever, throws it out of gear, and the teeth fall of their own weight." Another improvement consists in "the employment of a screw, or other equivalent, and jointed shaft irons, for setting the teeth at various inclinations while the rake is at work." Another improvement consists in the formation of drag shoes for horse rakes and other two-wheel carriages "in such manner that the weight will be taken off the back of the horse when going down hill." The drag shoe is constructed "in such manner that it shall follow the periphery of the wheel instead of resting immediately upon the ground," and has attached to it "a light frame, which supports the foremost part, and from which the line of draught is taken."

[Printed, &c. Drawing]

A.D. 1856, May 17.—No. 1166.

COLEMAN, RICHARD.—"Implements for ploughing, hoeing, and scarifying land."

1. The first part of the invention consists in supporting the frame or "bar of the ploughing, hoeing, or scarifying instruments by two bars jointed thereto which bars are jointed to and supported from the frame or carriage of the implement or machine. The bar or frame supporting the instrument is held by these jointed bars in a position parallel, or nearly so, to the surface of the land, and also to the carriage or travelling frame of the machine, and maintains constantly such parallelism when raised out of or when depressed and inserted into the ground." By means

of levers actuated by suitable gearing these bars can be raised or lowered to elevate or depress the implements. The machine may be drawn by horse, steam, or other suitable power.

2. The second part of the invention relates to horse hoes or hoes acted on by power, and consists in "mounting the hoeing instruments in a frame, which is fitted to the carriage in such manner that it has a traversing motion from side to side independent of the travelling carriage; in which motion it is controlled by a rack and pinion, or other suitable mechanical equivalent, actuated by the attendant walking behind," whereby the hoes may be guided so as to prevent injury to the crop.

[Printed, *Le. Drawings.*]

A. D. 1856, May 19.—No. 1181.

BOWHAY, JOHN LEAKEY.—(*Provisional protection only.*)—

"Improvements in drills for sowing seeds and distributing manure or water." "This invention relates, first, to a mode or modes of effecting the longitudinal adjustment of the seed or manure box of drills, so as to keep such box level on passing along hill sides." "The drill box is supported by a curved bar in the form of a quadrant, semi-circle, or other portion of a circle, or a complete circle, and this curved bar rests upon two or more anti-friction pulleys, or on a spur pinion or pinions." The box may be made to adjust itself, by attaching the upper end of a weighted arm perpendicularly to the crown of the said curved bar; or the level may be adjusted by means of racks and pinions, arranged in any convenient manner; but the inventor does not confine himself to any particular mode of obtaining the motion for effecting the adjustment of the seed or manure box."

Secondly, the invention relates to modes of driving the seed barrel, through gear, from a spur wheel on the nave of one of the running wheels. This spur wheel gears into a second wheel, carried in sliding brackets, and having fast on its spindle a third wheel, which gears into a fourth wheel, the centre of which works in slots in the upper part of supporting brackets; such slots being so curved from the centre of the third wheel, that the fourth wheel may move along the slots without becoming disengaged from the third wheel. Two links, working

freely on the axis of the fourth wheel, are connected at their outer ends to the seed or manure shaft, so that a fifth wheel, keyed on the said shaft, shall always be in gear with the fourth wheel; by this arrangement the said shaft will be free to rise or fall vertically. By another mode, a shaft, working in bearings at one end, and connected at the other end by a universal joint to the axis of the second and third wheels before-named, has on it a spur wheel, driven by a wheel on the nave of the opposite running wheel, and arranged to give a faster motion, so that the seed barrel may be driven faster on going up hill.

[Printed, &c. No Drawings.]

A.D. 1856, May 22.—No. 1228.

HOWARD, JAMES, and BAKER, GEORGE WILLIAMS.—"Apparatus applicable to the tilling of land."

In ploughing by steam, "turn-wrest ploughs" are used, attached by chains or cords to a "travelling frame," which is drawn forward by a wire rope or chain, passing over guide pulleys at suitable parts of the field, and thence to the winding on and off barrels of the engine. "The chains or cords from the several ploughs pass to their respective pulleys, which are mounted loosely on a shaft extending from end to end of the draw-frame, and are held fast when required by clutch-boxes operated by levers. This shaft acts simply as a draw-bar until the frame has traversed a given portion of the field; the frame then stops, and an axial motion is given to the shaft to wind up the plough chains, and thus to bring the ploughs to a line with each other at the end of the furrow." "When all have come up to line the travelling frame and ploughs are turned round to repeat the ploughing operation in the opposite direction." The guide pulleys over which the rope passes have each a "spherical boss, which fits a spherical projection on their axle." "A slight oscillating movement is thus allowed to these pulleys, to permit of their self-adjustment to suit the direction of the strain." The pulleys are held in position by means of a "kind of cork-screw anchor or holdfast." To assist "in the laying of the rope or chain upon the windlass," the inventors propose to use "rotating guides." In cases where the engine is made to travel over the field with the ploughs in action, they are con-



nected to pulleys as described, mounted on an axle at the tail of the engine.

The ploughs are fitted with handles as usual; and to each plough frame are attached two mould boards and shares made right and left handed. "These mould boards and shares, which are connected together, swing upon a common centre set in the upper part of the frame, and they thus admit of the one rising out of its place while the other is being brought into position for work." The ploughs are also suitably constructed for enabling the ploughman to adjust the draught, and to regulate the depth and width of the furrow by raising and lowering either or both wheels, or separating the wheels further apart by the use of a sliding piece. The ploughs may be worked either by horse or steam power.

[Printed, 1s. Drawings.]

A. D. 1858, May 27.—No. 1268.

NEWTON, ALFRED VINCENT.—(*A communication.*)—Reaping machines.

This invention relates to an arrangement for discharging the cut produce from the platform on to the ground. A rake is jointed to an arm "projecting from a travelling cam piece, which, besides sliding over its guide rod, is capable of turning thereon. The rake is kept in position, with respect to the arm which carries it, by means of a coil spring, the extremities of which are connected respectively to the rake and the arm. The traverse of the cam piece (which actuates the rake) is effected by means of a rock lever, which receives motion from a cam on the axle of the running wheel, and transmits that motion through a connecting rod to the cam piece. This cam is mounted loosely on its axle, and on its boss are formed ratchet teeth, which take on to a pin fixed on the axle and lock against it, a spring being provided at the opposite side of the cam to force it up into contact with the fixed pin. To prevent the rotation of the cam a bell crank lever arrangement is provided for taking off the pressure of the spring from the cam, and this arrangement is put in action by the foot or hand of the attendant. In the side of the platform recesses are cut to permit the rake teeth to pass down therein, and take forward all the cut produce on the platform. An opening is

“made in the platform at right angles to the line of traverse  
 “of the rake for the discharge of the corn, and when the  
 “rake arrives at that opening it meets with a fixed bowle,  
 “which turns it round on its fulcrum pin in a line parallel  
 “with the opening, and thereby the cut produce is thrown on  
 “to the ground. The cam piece having completed its traverse  
 “is turned on its guide rod, and the rake is thus raised clear  
 “of the platform, and in this position it is carried back to  
 “recommence its course. When it has arrived at its starting  
 “point the rake is depressed and the action is repeated. By  
 “the cam being driven as described, it follows that when the  
 “machine is being backed the fixed pin of the running wheel  
 “axle will slip past the ratchet teeth and no action will ensue,  
 “and the like end is attained by putting the bell crank lever  
 “arrangement in action.”

[Printed, &c. Drawing.]

A.D. 1856, May 28.—No. 1272.

CLARK, JOSEPH.—(*Provisional protection only.*)—“An improved horse hoe.” The machine consists of a beam, having handles at its hinder end, and supported at its foremost end by two wheels which are connected to a frame, so as to be capable of vertical adjustment, for the purpose of raising or lowering the beam; a joint is attached to the fore part, and a share to the hinder part of the body of the hoe. The drawing represents links and chains as fastened to the body of the hoe, and passing through gear at the head of the beam for the purpose of draught.

[Printed, &c. Drawing.]

A.D. 1856, June 2.—No. 1309.

GROLEY, JOSEPH.—(*Provisional protection only.*)—“Improved plough.”

The following is the whole Provisional Specification:—

“In order that a plough may stand steadily or be kept up  
 “when at work, whatever may be the motive power applied to  
 “it, it is necessary that it should have three supports. The  
 “ordinary plough has only one support. My invention consists of a plough in which I provide the two additional or  
 “supplementary supports which it appears to require. These

" supports consist of wheels or shoes, one of which is fixed to the beam at the side opposite to the mould board, either behind or in front of the share. This wheel or shoe not only acts as a support but also as a counterpoise ; and when the plough is travelling on unploughed ground produces an oscillating motion, which forms a good substitute for the hand of the ploughman. The other wheel or shoe is placed in front of the beam, and travels in and regulates the depth of the furrow. I place a toothed regulator in front of the beam to regulate the width of the furrow and the draught. This regulator is fixed in place by a bolt, which passes through the beam and keeps the plough to the ground. Air, steam, or any other motive agent may be employed to drive my improved ploughs."

[Printed, *ed.* No Drawings.]

A.D. 1856, June 2.—No. 1310.

MARSDEN, EDWARD. — " Instruments for pulverizing and cleaning land."

This invention relates to implements to be worked by steam, horse, or other power, " which take up, pulverize, and cleanse land at one operation." " They first take up a certain breadth of land upon a share, and then bring to bear thereon, according to the land being in a wet or dry state, mauls or rollers which may have chisels, ribs, or spikes attached thereto to pulverize or reduce it." The " mauls " are carried by radial arms on a rotating spindle. " The land next passes between rollers, and again between other rollers or drums with teeth, in order thoroughly to disintegrate the land, and remove twitch, weeds, or roots therefrom, which twitch, weeds, or roots are carried by a belt into a receiver. At the same time that the twitch is removed the machine takes up all stones above a certain size, which are either deposited in a receiver or thrown back upon the land as required." This is effected by a " pitching roller " formed of curved or radial arms on a central shaft. The earth is carried through the apparatus by an " endless chain or belt," composed of several chains or wires or other suitable material, with wires or rods fixed transversely thereon ; " and when sufficiently pulverised the earth descends through the spaces between the chains or wires, and either falls upon the ground beneath the machine

or else it is received by an endless travelling band, which deposits it in ridges at the side of the machine. The "pitching roller" may be used separately for clearing stones off the land.

[Printed, 10d. Drawing.]

A. D. 1856, June 2.—No. 1311.

BEADON, WILLIAM.—(*Provisional protection only.*)—"Improvements in agricultural implements for cleaning, cultivating and rolling land." "For these purposes in the fore part of the implement are applied several adjustable tynes suitable to act as a cultivator; and the fore part of the framing is supported by a wheel. Behind the cultivating tynes there is a roller, from the axis of which by a chain or suitable means, motion is given to an axis having fixed thereto several bent teeth, such axis being caused to rotate faster than the axis of the roller. Behind the roller and before the rotating axis with bent teeth the tynes of an underground harrow are applied, which have inclined projections on their upper surfaces, by which couch and roots are raised to the surface of the land. At the hinder part of the implement are the bent teeth of a rake for collecting couch and other roots and matters. These teeth can be raised by a lever from time to time." "The frame and parts are arranged in such manner as to admit of the teeth and working parts being lifted out of the land."

[Printed, 4d. No Drawings.]

A. D. 1856, June 6.—No. 1352.

CHAMBERS, THOMAS, junior.—"Improvements in agricultural drills," for the purpose of drilling or depositing at intervals, in place of continuously, seed and liquid manure, or other substance. This object is effected by applying "a rotating hollow wheel or chamber to each channel or furrow made by the drill." "The rotating hollow wheel or chamber has spouts or passages at intervals at its periphery. The seed and liquid manure or the seed, water, and manure are delivered into the interior of the rotating wheel or chamber from the separate compartments of the drill containing them, and they are retained from flowing out from the wheel or chambers, except when, by the rotation

" of the hollow wheel or chamber, a spout or outlet comes  
 " to the ground. The axis of the rotating wheels or chambers  
 " may receive motion by wheels thereon, which run on the  
 " land, and the running wheels may be made to expand and  
 " contract, to vary the distance at which the deposit takes  
 " place from the spouts or outlets, or the axis may receive  
 " motion by gearing from the drill."

[Printed, &c. Drawing.]

A.D. 1856, June 9.—No. 1364.

FIELD, WILLIAM, and JEFFREYS, EDWARD.—*Provisional protection only.*—"Improvements in machinery for sowing  
 " seed and for distributing manure." "The object of this  
 " invention is to prevent the choking of the spouts of seed  
 " and manure drills, and to ensure an equable discharge of  
 " seed or manure from the hoppers. For this purpose," the  
 " inventors say, "we provide a fan or fans, which are driven  
 " rapidly by suitable mechanism as the drill is moved across  
 " the field, and thus a blast of air is created, which forces  
 " forward the seed or manure as it drops from the cup rollers  
 " of the hoppers, and thereby effects its instant discharge from  
 " the spouts." "When sowing or manuring broadcast, we  
 " provide an exit passage or chute with a mouth extending  
 " the width of the machine."

[Printed, &c. No Drawings.]

A.D. 1856, June 23.—No. 1469.

ROGER, ROBERT.—*(Provisional protection only.)*—"Ma-  
 " chinery employed in the cultivation of land."

The invention consists in "constructing a travelling wind-  
 " lass, to be actuated by the endless cord of the Fisker's  
 " patent or other system of steam ploughing. The travelling  
 " windlass to have two drums, either on separate axles or on  
 " the same,—one to be winding on while the other is winding  
 " off the rope." At each end of the said machine is a "re-  
 " volving cultivator in the form of a spiked roller or digging  
 " machine wheel, having spiked teeth or bosses at certain  
 " intervals; one set of these is lowered in the ground and  
 " put in motion when the machine is going in one direction  
 " and when going in the opposite direction this set is raised  
 " and the other lowered into the ground." By removing

" a suitable number of the spiked teeth the cultivator  
 " or wheel will turn up large clods and expose them to the  
 " weather for winter or autumn tillage."

The "fixed windlass system of tillage," is adapted to the  
 rotary cultivator by "winding on one rope to one drum by  
 " means of the paying out of another while the machine is  
 " hauled in the other direction, so as to be in readiness to  
 " drive in, paying out when returning in the opposite direction."  
 There may be attached to an apparatus of this sort "a chain  
 " of buckets and knives, similar to those used in a dredging  
 " machine, and a suitable ladder and raising and lowering  
 " apparatus for cutting drains to any depth, and a sloping  
 " platform to deliver the soil so raised and cut on one or both  
 " sides of the drain."

[Printed, *ad.* No Drawings.]

A.D. 1856, July 3.—No. 1566.

CURWOOD, DAVID.—(*Provisional protection only.*)—"Im-  
 " provevements in horse rakes, which improved rakes may also  
 " be rendered applicable for scarifying land." The improve-  
 ments "consist in mounting the rake teeth or tines on an  
 " angular or A shaped frame, the traction of the horse may  
 " be at the apex of the angle, in which case the frame is  
 " furnished with a shield placed above and immediately behind  
 " the tines, against which shield the hay or other crop as it  
 " is raked up presses, and is guided so as to be thrown off on  
 " either side of the machine," thus forming two rows; or  
 " the rake may advance with the apex of the angular frame  
 " in the rear," and a portion of the frame at the apex be made  
 without teeth, in order to allow of one row of the crop being  
 left in the middle of the path traversed by the rake; or "the  
 " tines and shield may be so inclined to the course of the  
 " rake as to throw off the whole breadth of crop embraced by  
 " the rake on one side and so gather it in one row." The  
 height of the frame from the ground can be regulated by the  
 adjustment of three wheels, on which it is mounted. Two  
 hand levers are provided for tilting the machine, and raising  
 the tines from the ground. "By fixing another series of teeth  
 " or instruments suitable for scarifying the ground, the same  
 " arrangement and form of machine is applicable for that  
 " purpose."

[Printed, *ad.* No Drawings.]



A.D. 1856, July 5.—No. 1582.

SMITH, THOMAS. — "Improvements in horse rakes." The invention "consists in combining with each of the tines or "teeth a counterbalance weight, tending to raise the tines or "teeth from the land," whereby "sufficient strength can be "obtained without increasing the pressure of the tines or teeth "on the land." The tines or teeth may be bolted to projections on a series of bosses, mounted on a longitudinal axis, from each of which projects an arm to carry the counterbalance weight. Two forms of the said weights are described, one adjustable by sliding on the stem or lever of the tine, for the purpose of regulating the pressure of the tine on the land; the other arranged to turn back on the tine, when it is required to add to the weight of the tine.

[Printed, &c. Drawing.]

A.D. 1856, July 7.—No. 1592.

CAMBRIDGE, WILLIAM COLBORNE. — "An improvement in "the construction of press wheel rollers and clodcrushers." The object of the invention "is to make the wheels or discs of "such implements self-cleaning, so as to avoid the necessity "of employing scrapers or other extraneous contrivances," for removing earthy matters from the pressing surfaces. To effect this object, the inventor says, "I make the wheels or "discs of unequal diameters, and arrange them loosely on "a common axle, placing thereon alternately a wheel or disc "of the smaller and then one of the larger diameter, until a "sufficient number is placed on the axle to make up the "required breadth of rotating pressing surface. In the larger wheels I form the central hole (to receive the axle) of a "three-sided figure, and of such size as will permit of these "wheels preserving when in action the same mean ground "level as the wheels of smaller diameter, whose position with "respect to the ground is determined by the elevation of the "axle of the roller, to which they are fitted as usual. By this "arrangement the large wheels will be caused to make an "irregular or intermittent axial movement as the implement "is drawn over the ground, and at intervals slip on their axle "in a direction parallel to the line of draft, while the other

" or smaller discs will continue to rotate regularly ;" this action  
" will have the effect of rubbing off any clods that may adhere  
" to the pressing surfaces."

[Printed, 6d. Drawing.]

A.D. 1856, July 7.—No. 1593.

SMITH, HENRY.—" An improvement or improvements in the  
" manufacture of harrows." "My invention," the patentee  
says, " consists of the following method of constructing and  
" attaching the tines or tangs of harrows to the frames or  
" bodies of the said harrows. I form the tine or tang of cast  
" iron, and make, on the upper part of it, a shoulder of larger  
" dimensions than the lower part of the tine or tang. The  
" said shoulder bears against the frame, and by its breadth  
" gives great stability to the tine. In the shoulder of the  
" tine is formed a square or other shaped taper cavity, which  
" receives a taper plug of corresponding form of wrought iron,  
" which said plug is fastened in the said shoulder by a pin or  
" cotter passing transversely through the said shoulder and  
" plug."

" The upper portion of this plug is 'set' or 'shouldered  
" down,' into a round or other formed pin, the shoulder  
" abutting against the under side of the frame of the harrow,  
" and the round or other shaped pin passing through the said  
" frame, to which it is securely rivetted on the upper side,  
" thus rendering the harrow perfectly firm and secure, inde-  
" pendent of the tines. Before rivetting the end of the said  
" pin, I prefer to drop a washer on the said pin, so that the  
" said washer shall be interposed between the rivetted head  
" and the frame of the harrow."

[Printed, 8d. Drawing.]

A.D. 1856, July 10.—No. 1635.

FOWLER, JOHN, junior, and WORBY, WILLIAM. — "Ma-  
" chinery for ploughing and tilling land by steam."

" Two drums or capstans with upright or vertical axes are  
" with the steam engine which gives motion to them mounted  
" in a suitable frame on wheels, in order that the carriage  
" may be moved progressively on the land, in place of having  
" the capstans and steam engine anchored or fixed to the

“land.” The capstans are worked by the engine in such manner that they may alternately wind up their ropes, so that whilst one is being driven by the engine the other is running free, and unwinding its rope. “The pulley or apparatus from “and to which the plough or tilling instrument is drawn is “moved at the other end of the land to coincide with the “movement of the carriage with the engine and capstans “before mentioned. Or, in place of the two drums being on “the same carriage with the engine, two carriages may be used, “each with one upright barrel or capstan and an engine, and “the wire ropes be wound alternately by the drums. The “two carriages are to be caused to move opposite or parallel “to each other at the two headlands of the field.” “The “mould boards of the ploughs used are in some cases arranged “in combination with rotating harrows in such manner that “the mould boards” “raise the land from the furrows over “the teeth of the harrow.” As an anchor, the inventors use “a carriage with disc wheels which in being dragged along “cut into the land, and the tackle being fixed to the side of “the carriage, is resisted by the wheels so sunk into the land, “and in order to move two such carriages parallel, but at a “distance from each other, two more ropes are used, one “attached to each of the anchoring carriages.” “Such ropes “pass partly round pulleys, and are put in motion by capstans “or drums and steam engine anchored to a suitable part of “the land. The ploughs or tilling instruments are moved to “and fro between the anchoring carriages by wire ropes and “pulleys, the wire ropes receiving motion from capstans or “drums, and steam engine, anchored as above mentioned.”

[Printed, 2s. 6d. Drawing.]

A.D. 1866, July 11.—No. 1643.

MONCKTON, EDWARD HENRY CRADOCK.—Destroying insects, &c.

Chlorine, carbonic acid, or other heavy gas destructive of animal life is generated in a suitable receiver and distributed over the surface of the field, &c. This may be effected through pipes from a portable or stationary generator or by using a receptacle which can travel over the ground and distribute the gas through a suitable opening as it is produced. It is preferred to use carbonic acid gas, and this is to be made by

treating chalk with sulphuric or other acid in a receptacle properly arranged to admit of fresh supplies of chalk and acid being introduced, and fitted with an agitator.

[Printed, &c. No Drawings.]

A.D. 1856, July 12.—No. 1648.

POPE, JOHN.—(*Letters Patent void for want of Final Specification.*)—"Application of steam power to ploughing and other agricultural purposes."

The following is the whole Provisional Specification:—

"My invention of improvements in the application of steam power to ploughing consists in the application of a light locomotive engine mounted on broad wheels or rollers, having transverse ribs projecting on the periphery or other suitable projections, to hold the ground & afford sufficient bite for traction; the breadth of the wheels or rollers at the same time prevents any prejudicial sinking in the ground. I attach the ploughs by suitable traction bars or chains, using a sufficient number to plough at one time (or nearly so) the breadth covered by the wheels or rollers. All the ploughs are arranged the one in the rear of the other with room to work, the second plough throwing the land into the furrow made by the first, & the third one throwing the land into the furrow made by the second, & so on. Each plough has a man in the handles to guide & control it in the usual manner. Other implements may be attached to this engine and dragged over the ground in the same manner."

[Printed, &c. No Drawings.]

A.D. 1856, July 14.—No. 1655.

DENDY, RICHARD.—(*Provisional protection only.*)—"Improvements in horse rakes." "My improvements," the inventor says, "consist in constructing horse rakes with tubular frames, and with a seat for the driver mounted on saddles or curved pieces, which connect the back and front bars of the frames together (and likewise connect the shafts with the frame), and also in improved arrangements for lifting the teeth or tines. These arrangements consist in mounting a spindle in the frame of the machine in such manner that it may revolve freely therein; on this spindle the teeth of the rake rest, and the carrying or driving wheels

" are loosely mounted thereon, so that the spindle acts as an  
 " axletree. Two toothed clutches are keyed on the spindle  
 " one near each end thereof, beyond the rakes, and a toothed  
 " clutch is attached to each driving wheel on the inner side.  
 " These two latter clutches are brought in and out of gear  
 " with the two on the spindle by means of levers, connected  
 " together by a rod," worked by a hand lever, and "running  
 " from side to side of the machine within the front tubular  
 " frame." "Two cams or excentrics are mounted on the  
 " spindle, one at each side of the machine, in such a position  
 " as to act on rollers, one at each end of the lifting bar, which  
 " travel in grooves in the periphery of the cams, so that on  
 " working the levers to bring the clutches into gear, the  
 " revolution of the driving wheels is imparted to the spindle,  
 " and the cams acting on the rollers raise the lifting bar, and  
 " with it the teeth of the rake clear of the ground. Notches  
 " are cut in the frame of the machine to rest the lever, and  
 " thereby keep the teeth raised to any desired height. By  
 " suitable arrangements of gearing, or by a ratchet and pall,  
 " the toothed clutches may be so contrived as to effect the  
 " raising of the teeth of the rake at stated intervals."

[Printed, *ed.* No Drawings.]

A.D. 1856, July 17.—No. 1683.

CARTWRIGHT, JOHN.—"Improvements in agricultural im-  
 " plements called chain harrows, for more effectually dressing  
 " and cleaning land." This invention is intended to render  
 " chain harrows self-cleaning, and "consists in making such  
 " chain harrows with the links gradually decreasing in weight,  
 " that is to say, with heavy links in the first section, and with  
 " the succeeding section or sections formed of links of a  
 " lighter construction. By this improved arrangement of  
 " chain harrow, the clods are broken up by the first or heavy  
 " section, and the succeeding or lighter sections pulverise the  
 " soil still finer, beating the 'conch,' &c., perfectly clean,  
 " which instead of clogging or choking the harrow, becomes  
 " rolled together in a mass and left behind on the surface of  
 " the land." The inventor does not confine himself "to any  
 " particular form of the links themselves, or to any particular  
 " sectional form of the rod from which the links may be  
 " made."

[Printed, *ed.* Drawings.]

A.D. 1856, July 19.—No. 1704.

CLARK, WILLIAM STETTINUS. — (*A communication from Abraham Fitts.*) — "Apparatus for digging, pressing and moulding peat."

The digging part of the apparatus may be used for cutting drains in swampy land. It consists of a set of blades fixed parallel on vertical stems working through the arm of a sort of crane, pivotted to a wheeled frame running on a wooden tram so that it can be swung out to the side or brought over the frame. A curved blade is pivotted to these vertical blades so that it either falls under their ends or turns up behind them. The vertical blades are forced into the ground by a windlass and chain, or otherwise. They are then raised, when the curved blade "catches and turns under the ends of the others, cutting off the bottom and holding the whole between the blades." By means of the crane the whole is then swung over the platform, and the peat, &c. deposited in a suitable receptacle, or on the ground at the side.

[Printed, &c. Drawing.]

A.D. 1856, July 22.—No. 1728.

NEWTON, ALFRED VINCENT. — (*A communication from William H. Hovey.*) — "Machinery for reaping and mowing."

"This invention relates to certain improvements in reaping and mowing machinery whereby the clogging of the cutting apparatus is prevented, the replacing of single knives or cutters on the cutter bar is facilitated and an intermittent discharge of the cut grain laterally from the platform is effected by self-acting machinery." To prevent clogging, the cutter bar entirely covers the finger bar and it is "provided at its under side with a lip which overlaps the front edge of the finger bar, and forms with it a close joint that will not permit of grass or straw working in between the two bars." To prevent the driving wheel taking up stubble, &c., "its inner periphery is provided with cam projections instead of cog teeth for giving motion to the cutter bar; these cam projections actuate a rock lever armed with friction bowles, and through the lever (by means of a bell crank lever) a reciprocating motion is transmitted to the cutter bar." The cutters are secured to the bar "by a sort



" of bayonet joint ; they are shaped so as to drop on to the  
 " bar between fixed studs, and at their rear end they bear  
 " against a straight rib or square projection on the bar." "A  
 " metal lath slotted to correspond to the series of studs is  
 " dropped over the studs when the knives are in place, and a  
 " slight endway motion being given to it the narrow part of  
 " the slots slide under the heads of the studs, and thereby  
 " secures the knives firmly in their place. The gathering up  
 " of the corn on the platform, and the discharging of it in  
 " given quantities to form a sheaf, is effected by a travelling  
 " rake, the tines of which project upwards through the  
 " parallel bars of the platform, and in moving forward collect  
 " the corn and push it to one side of the platform where a  
 " swinging gate is situate. The traversing rake, as it moves  
 " forward, brings with it a finger which strikes against an arm  
 " on the axle of a rock shaft that actuates a system of jointed  
 " levers, causing them to rise from the platform and tip the  
 " advancing corn off the platform. A pin from the arm of  
 " this rock shaft operates through a slotted arm or rock shaft  
 " that carries the swinging gate, and thus opens that gate to  
 " permit of the discharge of the corn. This operation having  
 " been effected, the traversing rake then falls below the plat-  
 " form bars and travels back to its starting position, the  
 " jointed levers descend, and the swinging gate is closed as  
 " before. Motion is communicated from the driving wheel  
 " to these several parts by means of a cam on the driving  
 " wheel shaft actuating a rock lever connected at its free end  
 " to an endless chain ; this chain passes over pulleys mounted  
 " in a standard carried by the platform frame. On the axle  
 " of the lower pulley, which axle passes under the discharging  
 " side of the platform, is a second chain pulley, the endless  
 " chain of which extends to the opposite side of the platform,  
 " and passes over a fourth chain pulley ; this endless chain  
 " is attached to the travelling rake head, and by the reci-  
 " procating action of this chain the transverse motion is  
 " obtained."

[Printed, &c. Drawings.]

A.D. 1856, July 23.—No. 1746.

MABIE, GRASS.—(*Partly a communication from the late John H. Manny.*)—"Machinery for mowing and reaping."

The frame of the machine is mounted on two running wheels, one of which is the driving wheel, and the other is adjustable lengthwise of the machine to regulate the distribution of the weight. The cutters extend along the front of the frame, and the driving wheel is outside the line of the cutters; the draught pole being attached to the frame between the cutters and the driving wheel. The draught pole may be either rigidly attached to the frame, or jointed thereto and supported by a castor wheel. The driver's seat is over the wheel. The cutters are set on a reciprocating bar which receives its motion from a crank actuated by the driving wheel. The cutters are of two sorts; for reaping, or mowing "hard" and dry" grass, they are short, "sloping on the top," and file cut; for mowing "fine and soft" grass they "a trifle" longer and with knife edges." The finger bars are "so shaped that when fixed they break joint with each other and form on the under side of the cross bar," "a continuous covering." The "taper part of these finger guards covered by the sickle bar is scalloped at each side, and these provided with chamfered edges to aid the back-cut action of the knives." The cutters are sharp behind to clear away clogging matters. By means of a lever affixed to the front part of the machine, the cutters, &c. can be raised from the ground. There is a "dividing plate" with a "shoe" behind it, to separate the standing corn, &c. from that which is cut, and guide the latter back. The shoe fits over the end of the cutter bar; it is "of cast iron, and hollow outside, so as to prevent the clogging at the end of the sickle." When intended for reaping, a platform is fitted behind the cutters; and a reel over it. When used for mowing these are removed.

[Printed, 10d. Drawings.]

A.D. 1856, August 1.—No. 1825.

REEVES, ROBERT.—"Improvements in machinery for sowing or depositing seeds and manure." The invention consists, firstly, in "mounting revolving coulters or pressers on separate or independent axes." A series of frames, each of which carries an axis whereon a revolving coulters is mounted, may be attached to a bar placed across the front of the sowing machine. The said coulters is a cast-iron wheel, having a series of projections on its periphery, for the purpose of forming

holes, or V-formed grooves, in the land for the reception of the seed.

Secondly, in "causing each revolving coulter or presser to "actuate its own dropping apparatus." A series of studs or indentations are formed on one side of the revolving coulter, which studs, as the coulter revolves, come successively in contact with the end of a lever, carried by a standard attached to the frame; the other end of the lever has descending from it a rod, the lower end whereof is connected by a short arm to the axis of a valve, which closes the bottom of a box. The seed or manure to be deposited is dropped at intervals into the said box, by any of the means heretofore employed, where it is retained till one of the said studs on the coulter come in contact with the said lever. In place of dropping seed into the box at intervals, the box may be used as a seed reservoir, and, in place of the valve, a revolving cylinder, having indentations on its surface, may be so placed as to close the opening at the bottom of the box, and receive revolving motion, by means of a ratchet wheel at its extremity, from a driver on the end of the said rod in connection with the lever and studs; or the cylinder may be driven continuously by pulleys and a band, deriving motion from the revolving coulter.

Thirdly, in "actuating the depositing apparatus by means "of a wheel running on the land and having studs formed on "its side, which act on a lever communicating with the dropping apparatus." When a fixed coulter is used, instead of the revolving coulter, the actuating wheel is mounted on an axis at the side of the coulter frame.

[Printed, 10d. No Drawings.]

A.D. 1856, August 14.—No. 1900.

PRIEST, ALFRED, and WOOLNOUGH, WILLIAM.—"Improvements in horse hoes." In the improved horse hoe, the levers, which carry the stems of the hoes or cutting parts, move on pin joints carried by a bar, having arms, one at each end, with friction rollers mounted upon them and supported in boxes formed at the lower ends of vertical axes or standards, in such manner that, by a system of leverage, the said bar with the hoe levers may be moved from side to side, in order to adjust the hoes to the rows of the crop, without altering the depth of the

hoes on either side. The vertical axes or standards before-named are supported, so as to be capable of moving up and down, in sockets fixed to the framing of the machine; these sockets carry the fulcra of levers, the curved ends of which pass through slots formed in the vertical axes, in such manner that, when the levers are pulled downwards, their curved ends act against friction rollers carried by the vertical axes, and thereby raise the vertical axes together with the bar and hoe levers to any desired position, where they are retained by spring palls, which take into ratchet teeth formed on the sockets. The hoes may be raised completely off the land, by means of a lever fixed on a cross axis, whereon are fixed excentrics, connected, by means of chains, to the bar which carries the hoe levers. The inventors do not confine themselves to the exact details described, but what they claim is "the so arranging horse hoes with hoes rising and falling independently of each other, that the bar which carries the independent hoes may be raised or depressed at either end while the implement is in motion, so as to place the bar and hoes in an inclined position to suit the land."

[Printed, 1s. Drawings.]

A.D. 1856, August 18.—No. 1926.

CAMBRIDGE, WILLIAM COLBORNE. — (*Provisional protection only.*)—"Portable railways."

The invention consists in applying to the wheels of carts, carriages, and "various agricultural implements" a "flexible metallic road or railway, composed of sections or parts of any convenient length and adapted to the outside of the wheel in such a manner" that the sections may be laid down in front of the wheels continually. The "railway" is composed of broad iron plates, along the centre of each of which is "a raised rail of such a length as to admit of the several successive lengths of rail meeting or abutting against each other, end for end, so as to form a continuous rail." The plates are flanged, to prevent their becoming clogged with earth. The "sections" are "connected to centres by means of arms which as the carriage advances, lay down the sections successively in front of the wheels, and take them up again when the wheels have passed over."

[Printed, 4d. No Drawings.]

holes, or V-formed grooves, in the land for the reception of the seed.

Secondly, in "causing each revolving coulter or presser to "actuate its own dropping apparatus." A series of studs or indentations are formed on one side of the revolving coulter, which studs, as the coulter revolves, come successively in contact with the end of a lever, carried by a standard attached to the frame; the other end of the lever has descending from it a rod, the lower end whereof is connected by a short arm to the axis of a valve, which closes the bottom of a box. The seed or manure to be deposited is dropped at intervals into the said box, by any of the means heretofore employed, where it is retained till one of the said studs on the coulter come in contact with the said lever. In place of dropping seed into the box at intervals, the box may be used as a seed reservoir, and, in place of the valve, a revolving cylinder, having indentations on its surface, may be so placed as to close the opening at the bottom of the box, and receive revolving motion, by means of a ratchet wheel at its extremity, from a driver on the end of the said rod in connection with the lever and studs; or the cylinder may be driven continuously by pulleys and a band, deriving motion from the revolving coulter.

Thirdly, in "actuating the depositing apparatus by means "of a wheel running on the land and having studs formed on "its side, which act on a lever communicating with the dropping apparatus." When a fixed coulter is used, instead of the revolving coulter, the actuating wheel is mounted on an axis at the side of the coulter frame.

[Printed, 10*d*. No Drawings.]

A.D. 1856, August 14.—No. 1900.

PRIEST, ALFRED, and WOOLNOUGH, WILLIAM.—"Improvements in horse hoes." In the improved horse hoe, the levers, which carry the stems of the hoes or cutting parts, move on pin joints carried by a bar, having arms, one at each end, with friction rollers mounted upon them and supported in boxes formed at the lower ends of vertical axes or standards, in such manner that, by a system of leverage, the said bar with the hoe levers may be moved from side to side, in order to adjust the hoes to the rows of the crop, without altering the depth of the

hoes on either side. The vertical axes or standards before-named are supported, so as to be capable of moving up and down, in sockets fixed to the framing of the machine; these sockets carry the fulcra of levers, the curved ends of which pass through slots formed in the vertical axes, in such manner that, when the levers are pulled downwards, their curved ends act against friction rollers carried by the vertical axes, and thereby raise the vertical axes together with the bar and hoe levers to any desired position, where they are retained by spring palls, which take into ratchet teeth formed on the sockets. The hoes may be raised completely off the land, by means of a lever fixed on a cross axis, whereon are fixed eccentrics, connected, by means of chains, to the bar which carries the hoe levers. The inventors do not confine themselves to the exact details described, but what they claim is "the so arranging horse hoes with hoes rising and falling independently of each other, that the bar which carries the independent hoes may be raised or depressed at either end while the implement is in motion, so as to place the bar and hoes in an inclined position to suit the land."

[Printed, 1s. Drawings.]

A.D. 1856, August 18.—No. 1926.

CAMBRIDGE, WILLIAM COLBORNE. — (*Provisional protection only.*)—"Portable railways."

The invention consists in applying to the wheels of carts, carriages, and "various agricultural implements" a "flexible metallic road or railway, composed of sections or parts of any convenient length and adapted to the outside of the wheel in such a manner" that the sections may be laid down in front of the wheels continually. The "railway" is composed of broad iron plates, along the centre of each of which is "a raised rail of such a length as to admit of the several successive lengths of rail meeting or abutting against each other, end for end, so as to form a continuous rail." The plates are flanged, to prevent their becoming clogged with earth. The "sections" are "connected to centres by means of arms which as the carriage advances, lay down the sections successively in front of the wheels, and take them up again when the wheels have passed over."

[Printed, 4d. No Drawings.]



holes, or V-formed grooves, in the land for the reception of the seed.

Secondly, in "causing each revolving coulter or presser to "actuate its own dropping apparatus." A series of studs or indentations are formed on one side of the revolving coulter, which studs, as the coulter revolves, come successively in contact with the end of a lever, carried by a standard attached to the frame; the other end of the lever has descending from it a rod, the lower end whereof is connected by a short arm to the axis of a valve, which closes the bottom of a box. The seed or manure to be deposited is dropped at intervals into the said box, by any of the means heretofore employed, where it is retained till one of the said studs on the coulter come in contact with the said lever. In place of dropping seed into the box at intervals, the box may be used as a seed reservoir, and, in place of the valve, a revolving cylinder, having indentations on its surface, may be so placed as to close the opening at the bottom of the box, and receive revolving motion, by means of a ratchet wheel at its extremity, from a driver on the end of the said rod in connection with the lever and studs; or the cylinder may be driven continuously by pulleys and a band, deriving motion from the revolving coulter.

Thirdly, in "actuating the depositing apparatus by means "of a wheel running on the land and having studs formed on "its side, which act on a lever communicating with the dropping apparatus." When a fixed coulter is used, instead of the revolving coulter, the actuating wheel is mounted on an axis at the side of the coulter frame.

[Printed, 10d. No Drawings.]

A.D. 1856, August 14.—No. 1900.

PRIEST, ALFRED, and WOOLNOUGH, WILLIAM.—"Improvements in horse hoes." In the improved horse hoe, the levers, which carry the stems of the hoes or cutting parts, move on pin joints carried by a bar, having arms, one at each end, with friction rollers mounted upon them and supported in boxes formed at the lower ends of vertical axes or standards, in such manner that, by a system of leverage, the said bar with the hoe levers may be moved from side to side, in order to adjust the hoes to the rows of the crop, without altering the depth of the

hoes on either side. The vertical axes or standards before-named are supported, so as to be capable of moving up and down, in sockets fixed to the framing of the machine; these sockets carry the fulcra of levers, the curved ends of which pass through slots formed in the vertical axes, in such manner that, when the levers are pulled downwards, their curved ends act against friction rollers carried by the vertical axes, and thereby raise the vertical axes together with the bar and hoe levers to any desired position, where they are retained by spring palls, which take into ratchet teeth formed on the sockets. The hoes may be raised completely off the land, by means of a lever fixed on a cross axis, whereon are fixed eccentrics, connected, by means of chains, to the bar which carries the hoe levers. The inventors do not confine themselves to the exact details described, but what they claim is "the so arranging horse hoes with hoes rising and falling independently of each other, that the bar which carries the independent hoes may be raised or depressed at either end while the implement is in motion, so as to place the bar and hoes in an inclined position to suit the land."

[Printed, 1s. Drawings.]

A.D. 1856, August 18.—No. 1926.

CAMBRIDGE, WILLIAM COLBORN. — (*Provisional protection only.*)—"Portable railways."

The invention consists in applying to the wheels of carts, carriages, and "various agricultural implements" a "flexible" "metallic road or railway, composed of sections or parts of any convenient length and adapted to the outside of the wheel in such a manner" that the sections may be laid down in front of the wheels continually. The "railway" is composed of broad iron plates, along the centre of each of which is "a raised rail of such a length as to admit of the several successive lengths of rail meeting or abutting against each other, end for end, so as to form a continuous rail." The plates are flanged, to prevent their becoming clogged with earth. The "sections" are "connected to centres by means of arms which as the carriage advances, lay down the sections successively in front of the wheels, and take them up again when the wheels have passed over."

[Printed, 1d. No Drawings.]

A.D. 1856, August 23.—No. 1974.

STOCKS, SAMUEL.—(*Provisional protection only*).—"Reaping machines."

The following is the whole Provisional Specification:—

"My improvements in reaping machines consist in the application of circular cutters, similar to circular saws, & rotating on their axes in the same manner. These cutters are disposed across the breadth of the machine, & overlap each other, so as to cut the whole breadth at one time: they are driven at a quick speed by a strap or band in the usual manner. The crop as it is cut falls against an inclined platform or board, through which a series of teeth or tines are alternately projected & withdrawn; they all have a simultaneous motion towards one side of the machine, their motion in the opposite direction taking place during the time they are withdrawn within the limits of the platform.

"The tines or teeth are placed in rows, one set above another, each row or set being secured to a suitable rail or bar, to which the proper motion is transmitted by cranks or eccentrics actuated by the moving parts of the machine. This arrangement & action of rake teeth carries all the corn as it is cut towards one side of the machine, where it is delivered, laying it with regularity on the ground."

[Printed, &c. No Drawings.]

A.D. 1856, August 25.—No. 1978.

BARRAT, PIERRE PHILIPPE CELESTIN, and BARRAT, JEAN BAPTISTE.—(*Provisional protection only*).—"Improvements in steam digging apparatus suitable for draining and excavating purposes, parts of which are applicable to reaping." Improvements on No. 1151, A.D. 1853.

1. "Placing the large motive or running wheels behind the furnace."

2. Forming the wheels with a sheet iron felloe, bolted to or rivetted to flat or T-iron spokes, shaped like a truncated isosceles triangle, conveying to and supported by the nave."

3. "Dividing the nave of the large wheels into two parts, so that the wheels may slightly incline on the axle."

"Having a certain amount of play between the nave and axle."

5. "Arrangement by means of clutches, for throwing either  
" of the motive or running wheels out of gear without stop-  
" ping the revolution of the axle."
6. "Modifying the arrangement of gearing for driving the  
" fore carriage wheels simultaneously with the large motive or  
" running wheels."
7. "Placing shoes, skids, or guards on the peripheries of  
" the motive wheels."
8. "So arranging the axle of the fore carriage that it may  
" follow the undulations of the soil."
9. "Employing steam to tilt or incline the fore carriage in  
" working a curve or turning the machine."
10. "Connecting in a straight line the digger frame or carrier  
" and the framework of the engine."
11. "So arranging the digger shaft that it may be moved  
" nearer to or further from the soil without interfering with  
" the other parts of the machine."
12. "Effecting the up and down action of the diggers by  
" cams and connecting rods, by toothed wheels, or by cranks  
" and levers."
13. "Employment of a stop on the frame to regulate the  
" back stroke of the diggers."
14. "Employment of two diggers or digger cylinders of  
" different lengths on the same stock, placed at a greater dis-  
" tance from each other than the thickness of the strip of soil  
" to be loosened, and contrived to effect a better division or  
" loosening of the soil."
15. "Employment of three or more diggers or digger cylin-  
" ders on the same stock, at a greater distance one from the  
" other than the thickness of the strip of earth to be loosened  
" —the length increasing as they approach the bottom of the  
" stock."
16. "Applying the machinery for excavating and digging  
" canals and drains."
17. "Mounting forks or teeth behind the engine-driver's  
" seat or the digger carrier, to pulverize and break up the  
" earth."
18. "Employing fixed cylinders (instead of oscillating  
" cylinders) with connecting rods for transmitting the action  
" of the piston to the levers which carry the digging  
" shaft."

holes, or V-formed grooves, in the land for the reception of the seed.

Secondly, in "causing each revolving coulter or presser to "actuate its own dropping apparatus." A series of studs or indentations are formed on one side of the revolving coulter, which studs, as the coulter revolves, come successively in contact with the end of a lever, carried by a standard attached to the frame; the other end of the lever has descending from it a rod, the lower end whereof is connected by a short arm to the axis of a valve, which closes the bottom of a box. The seed or manure to be deposited is dropped at intervals into the said box, by any of the means heretofore employed, where it is retained till one of the said studs on the coulter come in contact with the said lever. In place of dropping seed into the box at intervals, the box may be used as a seed reservoir, and, in place of the valve, a revolving cylinder, having indentations on its surface, may be so placed as to close the opening at the bottom of the box, and receive revolving motion, by means of a ratchet wheel at its extremity, from a driver on the end of the said rod in connection with the lever and studs; or the cylinder may be driven continuously by pulleys and a band, deriving motion from the revolving coulter.

Thirdly, in "actuating the depositing apparatus by means "of a wheel running on the land and having studs formed on "its side, which act on a lever communicating with the dropping apparatus." When a fixed coulter is used, instead of the revolving coulter, the actuating wheel is mounted on an axis at the side of the coulter frame.

[Printed, 10d. No Drawings.]

A.D. 1856, August 14.—No. 1900.

PRIEST, ALFRED, and WOOLNOUGH, WILLIAM.—"Improvements in horse hoes." In the improved horse hoe, the levers, which carry the stems of the hoes or cutting parts, move on pin joints carried by a bar, having arms, one at each end, with friction rollers mounted upon them and supported in boxes formed at the lower ends of vertical axes or standards, in such manner that, by a system of leverage, the said bar with the hoe levers may be moved from side to side, in order to adjust the hoes to the rows of the crop, without altering the depth of the

hoes on either side. The vertical axes or standards before-named are supported, so as to be capable of moving up and down, in sockets fixed to the framing of the machine; these sockets carry the fulcrum of levers, the curved ends of which pass through slots formed in the vertical axes, in such manner that, when the levers are pulled downwards, their curved ends act against friction rollers carried by the vertical axes, and thereby raise the vertical axes together with the bar and hoe levers to any desired position, where they are retained by spring palls, which take into ratchet teeth formed on the sockets. The hoes may be raised completely off the land, by means of a lever fixed on a cross axis, whereon are fixed eccentrics, connected, by means of chains, to the bar which carries the hoe levers. The inventors do not confine themselves to the exact details described, but what they claim is "the so arranging horse hoes with hoes rising and falling independently of each other, that the bar which carries the independent hoes may be raised or depressed at either end while the implement is in motion, so as to place the bar and hoes in an inclined position to suit the land."

[Printed, 1s. Drawings.]

A.D. 1856, August 18.—No. 1926.

CAMBRIDGE, WILLIAM COLBORNE. — (*Provisional protection only.*) — "Portable railways."

The invention consists in applying to the wheels of carts, carriages, and "various agricultural implements" a "flexible" "metallic road or railway, composed of sections or parts of any convenient length and adapted to the outside of the wheel in such a manner" that the sections may be laid down in front of the wheels continually. The "railway" is composed of broad iron plates, along the centre of each of which is "a raised rail of such a length as to admit of the several successive lengths of rail meeting or abutting against each other, end for end, so as to form a continuous rail." The plates are flanged, to prevent their becoming clogged with earth. The "sections" are "connected to centres by means of arms which as the carriage advances, lay down the sections successively in front of the wheels, and take them up again when the wheels have passed over."

[Printed, 4d. No Drawings.]



A.D. 1856, August 23.—No. 1974.

STOCKS, SAMUEL.—(*Provisional protection only*).—"Reaping machines."

The following is the whole Provisional Specification:—

"My improvements in reaping machines consist in the application of circular cutters, similar to circular saws, & rotating on their axes in the same manner. These cutters are disposed across the breadth of the machine, & overlap each other, so as to cut the whole breadth at one time: they are driven at a quick speed by a strap or band in the usual manner. The crop as it is cut falls against an inclined platform or board, through which a series of teeth or tines are alternately projected & withdrawn: they all have a simultaneous motion towards one side of the machine, their motion in the opposite direction taking place during the time they are withdrawn within the limits of the platform."

"The tines or teeth are placed in rows, one set above another, each row or set being secured to a suitable rail or bar, to which the proper motion is transmitted by cranks or eccentrics actuated by the moving parts of the machine. This arrangement & action of rake teeth carries all the corn as it is cut towards one side of the machine, where it is delivered, laying it with regularity on the ground."

[Paused, &c. No Drawings.]

A.D. 1856, August 25.—No. 1978.

BARRAT, PIERRE PHILIPPE ORLESTIN, and BARRAT, JEAN BAPTISTE.—(*Provisional protection only*).—"Improvements

"in steam digging apparatus suitable for draining and excavating purposes, parts of which are applicable to reaping."

Improvements on No. 1151, A.D. 1853.

1. "Placing the large motive or running wheels behind the furnace."

2. Forming the wheels with a sheet iron felloe, bolted to or rivetted to flat or T-iron spokes, shaped like a truncated isosceles triangle, conveying to and supported by the nave."

3. "Dividing the nave of the large wheels into two parts, so that the wheels may slightly incline on the axle."

"Having a certain amount of play between the nave and axle."

5. "Arrangement by means of clutches, for throwing either  
" of the motive or running wheels out of gear without stop-  
" ping the revolution of the axle."
6. "Modifying the arrangement of gearing for driving the  
" fore carriage wheels simultaneously with the large motive or  
" running wheels."
7. "Placing shoes, skids, or guards on the peripheries of  
" the motive wheels."
8. "So arranging the axle of the fore carriage that it may  
" follow the undulations of the soil."
9. "Employing steam to tilt or incline the fore carriage in  
" working a curve or turning the machine."
10. "Connecting in a straight line the digger frame or carrier  
" and the framework of the engine."
11. "So arranging the digger shaft that it may be moved  
" nearer to or further from the soil without interfering with  
" the other parts of the machine."
12. "Effecting the up and down action of the diggers by  
" cams and connecting rods, by toothed wheels, or by cranks  
" and levers."
13. "Employment of a stop on the frame to regulate the  
" back stroke of the diggers."
14. "Employment of two diggers or digger cylinders of  
" different lengths on the same stock, placed at a greater dis-  
" tance from each other than the thickness of the strip of soil  
" to be loosened, and contrived to effect a better division or  
" loosening of the soil."
15. "Employment of three or more diggers or digger cylin-  
" ders on the same stock, at a greater distance one from the  
" other than the thickness of the strip of earth to be loosened  
" —the length increasing as they approach the bottom of the  
" stock."
16. "Applying the machinery for excavating and digging  
" canals and drains."
17. "Mounting forks or teeth behind the engine-driver's  
" seat or the digger carrier, to pulverize and break up the  
" earth."
18. "Employing fixed cylinders (instead of oscillating  
" cylinders) with connecting rods for transmitting the action  
" of the piston to the levers which carry the digging  
" shaft."

19. "Dispensing with one of the shafts which carry the  
"gearing wheels, (and employing other gear wheels)."

20. "Applying the apparatus for reaping by employing  
"reaping apparatus in place of the diggers."

[Printed, *ad.* No Drawings.]

A.D. 1856, September 5.—No. 2065.

MONCKTON, HENRY EDWARD CREADOCK, and CLARK, WILLIAM.—"Apparatus for tilling or cultivating the soil."

1. The first part of the invention consists of "a rotatory  
"tilling instrument for cutting up and inverting the soil,  
"which instrument has a longitudinal motion imparted to it  
"in the direction of the length of its axis simultaneously with  
"its motion of rotation. This rotatory tiller may consist of  
"blades wound helically round the axis, but of an increasing  
"diameter, so that when rotating rapidly it will represent the  
"appearance of a cone." "The tilling instrument while rota-  
"ting travels with the axis, advancing with the small end of the  
"cone first, and produces a trench or furrow," cutting the  
"soil from the land side. "It operates first on the surface soil,  
"which it throws into the trench previously made; as the  
"larger part of the cone advances it cuts deeper, and throwing  
"the soil taken from the greatest depth for the most part on  
"the top of that first removed. By making this tilling instru-  
"ment double coned, that is, coned towards both ends, it can  
"be worked backwards and forwards, and so continue its  
"workings without the necessity of turning the machine round  
"at the headlands." The instrument is actuated by steam  
"power, and for this purpose it is connected to the side of a  
"steam carriage, which travels on the land side on unbroken  
"land. The carriage is supported by two broad rollers, formed  
"with ribs on their peripheries to give them a firm hold of the  
"ground; "or it may be carried over the ground by any suitable  
"machinery of support having propelling power applied  
"thereto."

2. A digging machine worked by steam power is described.  
It consists of "successive rows or series of spade-like diggers,  
"put in motion by means of cranks or other suitable means.  
"These diggers individually do not dig deeper than about one  
"and a half or two inches, but the successive rows are placed  
"at different elevations, forming an incline from the front to

"the rear of the machine. In operating with the instrument  
"an inclined trench or space equal to the area of the digging  
"frame and the machine is placed therein." As it advances  
"each row across the breadth of the machine enters the  
"ground to the depth of two inches, and tosses the soil in a  
"backward direction, each successive row being deeper than  
"that preceding it, the last in succession, although only pene-  
"trating the new ground to the depth of two inches, yet, by  
"reason of its inclined position, it is digging the earth some  
"eight or ten inches below the original surface." The ma-  
chine is supported by a broad roller in front, and by two broad  
wheels behind.

3. "A modification of this machine consists in the application  
"of a series of rotary diggers in lieu of the vertical or inclined  
"spade diggers. These consist of cylinders with radial  
"digging tines or teeth, the cylinders being placed one  
"behind the other, and each in succession at a lower level, so  
"as to work in an inclined trench or space, which their action  
"maintains as the machine advances."

"A further addition to these last machines consists in the  
"application of two scrapers, one on either side of the machine,  
"which scrape the surface soil from the land on each side  
"into the lower or deepest part of the trench as the machine  
"progresses."

[Printed, 1s. 4d. Drawings.]

A. D. 1856, September 8.—No. 2089.

FWLER, JOHN, junior.—"Apparatus for ploughing and  
"tilling land by steam."

The first improvement relates to the invention described in  
No. 512, A. D. 1856, in which a lever frame mounted on a  
central axis supported by running wheels, and drawn to-  
and-fro across the field, is fitted with a set of ploughs or other  
tilling instruments at each end, one set going out of action as  
the other set descends and comes into action. The improve-  
ments consist in "applying a 'locking' motion to the central  
"axle and wheels, so as to cause the ploughing machine to be  
"guided; and such guiding is accomplished by the plough-  
"man who accompanies the machine giving motion to a screw  
"or other convenient apparatus acting on the central axis, so  
"as to cause it and the wheels thereon to perform the requisite  
"locking motion."

The second part of this invention consists in a mode of communicating motion to the anchor carriage described in No. 1635, A.D. 1856. For this purpose "the axle of the pulley carried by such carriage, and around which the draft rope passes, is caused to give motion by intermediate gearing to the axle or axles of the disc wheels on which such anchoring carriage moves, by which means the draft rope put in motion by a steam engine, in addition to moving the ploughs or tilling instruments, gives motion to the anchoring carriage."

[Printed, 1s. Drawings.]

A.D. 1856, September 9.—No. 2101.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from F. H. Outin.*)—"An improvement in and apparatus for sprinkling substances in a state of powder." The invention consists, firstly, in "the sprinkling, scattering, or distributing of substances in a state of powder by means of a brush, broom, bunch, cluster, tufts, or fibres of cloth, horsehair, rush, fine wire, or other equivalent material, to which the substance to be sprinkled is supplied in such manner as to pass wholly or partially through the fibres and filaments, and whereby on shaking or agitating them the said substance is sprinkled about and well distributed or dispersed."

Secondly, in "the employment, for sprinkling or scattering seeds, manure, spices, sulphur, and other substances in a state of powder, of a brush, broom, tuft, or cluster of filaments of fibrous material, wire, shreds, or other equivalent substance attached to a perforated plate or socket, or other like sifting agent similar in action to a sieve."

Thirdly, in the arrangement of a particular sprinkling apparatus, which consists of "a hollow conical handle" "to the bottom of which is screwed or otherwise attached a perforated plate or a moveable cap or socket, with perforated or not work bottom, to which is fastened a brush or broom, consisting of a tuft or cluster, or of tufts, clusters, or strips of wool, cloth, shreds, hair, fine wire, or other suitable material attached to some of the orifices in the perforated cap, while others of the orifices are left free and open. The top of the handle is closed" by means of a fixed or removable cap, and "pegs for the better dividing of the substance may be inserted within the handle." "For distributing seed and

"manure in a divided state a number of these implements  
"may be mounted on a framework," or on any part of a seed  
planter or manure distributor.

[Printed, 8d. Drawing.]

A.D. 1856, September 10.—No. 2114.

DAVIDSON, JOSEPH CHRISTIAN. — (*Provisional protection only.*) — "An improved construction of share drill." The  
"object of this invention is to provide a ready means of  
"adjusting share drills to the required depth for sowing, and  
"to prevent the necessity for shifting the position of the  
"shares in their sockets. This," the inventor says, "I propose  
"to do by mounting the drill frame on adjustable running  
"wheels (fitted like plough wheels), and by transmitting  
"the motion from one or both of the running wheels to the  
"axle of the seed roller through an intermediate wheel carried  
"by an adjustable swinging arm, which has its fulcrum on  
"the seed roller axle. By this arrangement the shares will  
"not require to be shifted, but the wheel stems may be  
"slid up and down in their sockets, and the intermediate  
"wheel adjusted (by slackening a binding screw that fixes  
"the swinging arm to the drill box) to suit the change of  
"position."

[Printed, 4d. No Drawings.]

A.D. 1856, September 10.—No. 2115.

DAVIDSON, JOSEPH CHRISTIAN. — (*Provisional protection only.*) — "Hop bin or hop frame."

The following is the whole Provisional Specification: —  
"This invention relates to the manufacture of hop bins or  
"temporary receptacles for the green hops in a manner that  
"will admit of their lateral contraction, the object being to  
"enable the workmen to carry them through narrow spaces  
"in the hop field (for the purpose of placing them between  
"the rows of hops to be picked) without the necessity for  
"removing obstructing hop poles, and also to allow of the  
"bins being closely packed away when not required for use.  
"Instead of forming a rigid rectangular frame for carrying  
"the sucking I form the ends of the bin frame each of two  
"bars or poles jointed together at top, and capable of closing  
"on each other or standing out like struts. These two ends



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" I connect together by cross bars, which extend beyond the struts and form handles for carrying the bin. To give rigidity to the structure I apply rods at the angles to secure the cross bars firmly to the ends of the frame. Within this frame a sacking is suspended which forms the receptacle for the picked hops. When the receptacle is empty the bin can be closed like a folding camp stool, and a large number may be piled away in a comparatively small space."

[Printed, 4d. No Drawings.]

A.D. 1856, September 11.—No. 2121.

ROBINSON, JOHN BLYTHE.—(*A communication.*)—" Machinery for effecting agricultural operations."

Improvements on No. 1151, A.D. 1853, and No. 35, A.D. 1855. In this case the digging machine is not drawn by horse power, but it is propelled by the steam engine, which actuates the digging cylinder. The greater part of the Specification is occupied with improvements in the engine. The machine travels on a pair of front castor wheels, whereby it can be guided, and upon a pair of large and broad hind wheels, having a groove in the middle of the periphery, with teeth formed therein, to gear with pinions by which they are put in motion. For soft and wet soils, the bite of the wheels is increased by fixing conical or rectangular spikes or studs on the periphery.

The digging cylinder is furnished with a series of "separate knives or cutters, so formed that no portion of their surface except their cutting edges shall be exposed to the resistance of the soil in effecting its abrasion." Two forms of cutters are represented. One is similar to the common blades or hoes of a horse hoe, the end of the stem, which is bolted to the cylinder, being turned at a right angle. The other resembles a lozenge or rhomb, carried by a curved stem, affixed to the cylinder.

[Printed, 1s. 10d. Drawings.]

A.D. 1856, October 17.—No. 2441.

LAWES, THOMAS.—(*Provisional protection only.*)—"Agricultural implement to be used in tilling the land."

The following is the whole Provisional Specification:—

" My invention, which has reference to a method of raising or lowering the cylinder, containing the tines or teeth of a machine employed for tilling or digging the land, so as to

" discontinue the operation of digging or enable the machine  
 " to be turned round when necessary, consists of a framework  
 " of wood, enclosing an iron cylinder, provided with arms at  
 " each end, through the centre of which an horizontal shaft  
 " or axle passes, supported on suitable bearings attached to  
 " the frame, the entire surface or periphery of the said cylinder  
 " being provided with tines; an eccentric wheel firmly keyed  
 " on each end of the shaft being employed for the purpose of  
 " raising or lowering the machine when necessary, and pro-  
 " vided with small running wheels on that part of each  
 " eccentric which is farthest from the shaft or axle. When  
 " the machine is required to be raised or lowered, the eccentric  
 " wheels and running wheels which are firmly locked, and  
 " remain at the upper portion of the apparatus whilst at work,  
 " are released through the medium of a clutch or coupling  
 " box, so as to perform half a revolution on the machine being  
 " put in motion, and thus be brought to the lower part of the  
 " cylinder, and cause the tines to be raised a sufficient distance  
 " from the earth."

[Printed, &c. No Drawings.]

A. D. 1856, November 5.—No. 2607.

**BLACKWELL, WILLIAM.**—(*Provisional protection only.*)—

" Ploughs."

This invention consists "in suspending (by links) beneath a  
 " frame or carriage, mounted on wheels, one, two, three, or  
 " more ploughs, in such a manner that they can be simul-  
 " taneously lifted (by a lever) out of and clear of the earth,  
 " while removing the whole from one course of furrows to  
 " commence another, or to a separate field, or to a distant part  
 " in the same field. The whole is supported on wheels,  
 " which are mounted in forks, and are capable of being  
 " swivelled partly round in any direction." The wheels and  
 " forks are connected so that they can be moved by a single hand  
 " lever which can be clamped in any required position. "The  
 " draught chains may be applied directly to the beams of the  
 " ploughs, or partly to the carriage and ploughs, so as to  
 " divide the draught between them." "The shares and mould  
 " boards are made in a piece, either by hammering or casting  
 " them, and are securely fixed to the beams at top." The  
 " inventor dispenses with side and sole plates.

[Printed, &c. No Drawings.]

F. L.

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A.D. 1856, November 12.—No. 2663.

COLLETT, HENRY.—(*Provisional protection only.*)—"Ma-  
"chinery for mowing and reaping."

The following is the whole Provisional Specification :—

"This invention has for its object improvements in machinery  
"for mowing and reaping. For these purposes a rectangular  
"or other suitable form of frame is mounted on two wheels,  
"one on either side of the frame, and a third, by preference a  
"fore wheel, is also used. A vertical shaft or axis is employed,  
"with cutting blades fixed to the lower end of the shaft, such  
"blades being either curved or straight. The cutter shaft or  
"axis is put in motion by means of another axle by toothed  
"or mitre wheels. The driving axis or shaft receives motion  
"by hand by means of a cranked handle. The machine is,  
"by preference, to be made light, so as to be moved or pushed  
"forward by the same man who by the crank axle gives  
"motion to the cutter axis. Or the machine may be made  
"larger, and be propelled or moved by a man, or it may be  
"by horse or other power, the cutter axis or shaft, however,  
"still receiving its motion as above described."

[Printed, 6d. No Drawings.]

A.D. 1856, November 13.—No. 2677.

NEWINGTON, SAMUEL.—"Improvements in dibbling appa-  
"ratus."

The grain or seed is contained in an angular trough, divided  
into as many compartments as there are dibbles. "Within  
"and at the bottom of the trough is a sliding bar, having a  
"hole through it for each dibble and it is by this hole that  
"the grain or seed is allowed to fall when the bar has been  
"moved into position to bring the holes to coincide with  
"inclined holes through the bottom of the trough, such  
"inclined holes communicating with the holes or passages  
"through which the dibbles slide at the back of the trough."  
The dibbles and the trough may be carried by handles and  
apparatus similar to those described by the inventor in the  
Specification of a former patent, or by any other convenient  
means. The dibbles are shown in the drawings as fixed to the  
lower bar of an upper handle and frame, the seed trough being  
fixed to an under handle, and a curved lever, which passes

through a slot in the dibble bar, and has its lower end passing into a slot formed in the sliding bar, serves, by the raising of the dibbles, to move the sliding bar, and to bring the holes therein to coincide with the inclined holes which communicate with those within which the dibbles move, whereby the seed or grain will be caused to drop into the holes made by the dibbles in the earth; brushes, fixed within the trough, and capable of being shifted up and down to suit bars of different thickness, prevent more grain falling than is contained in the holes of the sliding bar. The inventor lays no claim to any of the parts separately, nor does he confine himself to the precise details, but what he claims is "the combination of apparatus for dibbling herein described."

[Printed, 1s. 2d. Drawings.]

A.D. 1856, November 17.—No. 2716.

**HAWKES, WILLIAM.**—(*Provisional protection only.*)—"Applying steam power to the ploughing of land and other agricultural operations."

The following is the whole Provisional Specification:—

"My invention consists of the machinery herein-after described to be attached to the ordinary portable engine, and applied to the ploughing of land and other agricultural operations. I make the tractile power act in a direct line upon the implement to be moved, the engine being placed lengthways with the line of draught. Two pulleys or drums of large diameter are worked alternately by a pinion being made to engage alternately in spur wheels on the said pulleys. The implement is drawn backwards and forwards across the field by means of a rope or chain working over a snatch pulley attached to an anchor carriage placed on the opposite side of the field. The engine is upon wheels at right angles to its longitudinal axis, and both the engine and anchor carriage are moved from time to time by means of chains made fast at one end and coiled over pulleys worked by the engine."

[Printed, 4d. No Drawings.]

A.D. 1856, November 27.—No. 2810.

**WOOFE, WILLIAM.**—"An implement for paring land, applicable also to the removal of turf." "In its general

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A. D. 1856, December 11.—No. 2947.

**CAMBRIDGE, WILLIAM COLBORNE.**—“ Portable railway.”

The invention consists in fitting round the wheels of traction engines, &c. a sort of endless chain of flat plates connected by links. The plates are each fitted with a central rail, on which the wheel travels, and have flanges which hold them to the periphery of the wheel. The connecting links are pin-jointed to the plates at a point midway from their ends, so that each plate works freely as on a pivot, being only supported at that point. The invention may be adapted to “a portable steam engine, steam plough, or other implement.” The “railway” can be removed by taking out the pin connecting any one of the plates to its links.

[ Printed, 6d. Drawing ]

A. D. 1856, December 12.—No. 2958.

**NEWINGTON, SAMUEL.**—*Provisional protection only*.—

“ Improvements in hand hoes and cultivators.” “ This invention consists in a method of constructing hand hoes which by changing certain of the parts can be converted into cultivators. The instrument consists of a stem or handle, which is bent so as to adjust the draft. On the end of this handle is a cross bar, having two slotted holes at its ends for receiving the stems of the cutter, which is formed of a bar of steel, turned up at a right angle at its two ends so as to form stems. The bar is made thicker in the middle than at the centre edges, which are both sharpened so that it can be turned round when one edge becomes blunt. The cutter is fastened to the cross bar of the handle by means of two clamp screws (in connection with the cross bar), which press against the stems of the cutter and retain them at any desired angle in the slots of the cross bar.” “ The cross bar also carries behind the cutter two instruments or coulters, which turn over the weeds when cut. The instrument is furnished with moveable weights, one or more of which is placed on the cross bar, as the nature of the soil requires. When it is desired to convert the instrument into a cultivator the cutter and coulters above described are removed, and two or more hoeing and stirring blades carried by an iron bar are screwed to the cross bar of the instru-

" ment; or in place of the cutter first described for cutting  
" weeds a V-formed cutting blade may be used when the  
" object is to stir the land in the centre of the furrow to a  
" considerable depth. The instrument with the cutter first  
" described may be used for paring turf.

[Printed, 4d. No Drawings.]

A.D. 1856, December 22. —No. 3028.

THURLOW, THOMAS LYON. —" Reaping machines."

The apparatus is supported on two pair of running wheels connected by a pole to which the horses are harnessed so that they walk between the fore and hind wheels. To guide the machine the hinder pair of wheels can be turned to one side or the other by a circular rack and pinion driven by a winch handle. The cutting apparatus is attached to a frame carried by the front pair of wheels and is actuated therefrom. It can be raised and lowered by a segmental rack on the fore axle gearing with a worm on a shaft carried back to the hind wheels and turned by a handle there. The running wheels have spur wheels on them, which gear with pinions on a transverse shaft across the machine. These pinions are connected with the shaft by ratchets and pulls, so that the bearing wheels may revolve at different velocities. A spur wheel on this shaft gears with a pinion on a parallel shaft, and mounted thereon so that the shaft may slide through it. Bevel pinions on this shaft gear with pinions on the end of a pair of rollers mounted so that an endless travelling apron carried by them forms an incline behind the cutters. By sliding the shaft either one of a pair of opposite pinions can be caused to engage with each of the roller pinions, so that these can be driven in either direction to carry the crop to either side. This is effected by a lever worked by a shaft from the hinder end of the machine. The cutters are vibrating, being pivotted to a bar along the front of the machine, and they are operated by an eccentric on the lower end of one of the rollers and a rod attached thereto and to each cutter. The cutters "have an undulating curved form in front, where they are sharp and finely serrated."  
"Immediately above them is fixed a sharpened plate,"  
"with projecting points having its curved edges also serrated."  
Bolts pass through this plate and through slots in the cutter-



blades to keep the latter close up to the plate. The draught pole may be made telescopic, as also the shafts carried along it and operating the mechanism for raising or lowering the cutters, and for throwing the apparatus in and out of gear.

[Printed, 10d. Drawings.]

1857.

A. D. 1857, January 2.—No. 22.

BAIRD, JOHN.—(*Provisional protection only.*)—"Improve-  
ments in planting potatoes." The invention consists of  
"combining apparatus for making furrows, depositing pieces  
"of potatoes, and covering the same." On the axle of two  
side wheels of the implement, at the fore part of which are  
attached one or more shares or ploughs for making the furrows,  
is carried a hollow rotating apparatus divided into compart-  
ments, "openings out of which (at the periphery) are at a  
"distance apart equal to that at which the pieces of potatoe  
"are to be deposited in the furrow." Each opening is pro-  
vided with two doors, which are by preference closed by a  
spring, and are opened outwards "by a projection from one  
"of the doors coming against a lever or suitable instrument,"  
"when the compartment to which they belong comes below  
"the axis of rotation, and the piece of potatoe in such com-  
"partment will drop out into the furrow below." The pieces  
of potatoe are contained in a holder at the back of the machine,  
and are supplied to the depositing apparatus by a rotating  
feeder, having "as many inclines formed on its periphery as  
"there are compartments in the rotating apparatus, and at  
"the end of each incline is formed a recess or cup," which,  
during the revolution of the depositing and feeding apparatus,  
which are geared together, supplies its respective compartment  
through the doors in the same with one or more pieces of  
potatoe: "or the doors may be dispensed with, and the  
"rotating depositor may revolve within a fixed case, open at  
"bottom to admit of the passage of the pieces of potatoe  
"from the compartments as they come round." The hinder  
part of the machine is supported by a wheel or wheels, and  
"is provided with ploughs to cover in the furrow or furrows;"

" or the apparatus may be arranged single," the ploughs being omitted, in which case it is to be wheeled over a furrow produced by a separate plough.

[Printed, 4*cl.* No Drawings.]

A. D. 1857, January 17.—No. 142.

VASSEROT, CHARLES FRÉDÉRIC.—(*A communication from Louis Marie Pierre Merleau d'Illiers.*)—"Covering all description of grain with a fertile substance or manure, and the apparatus employed for the same."

"This invention consists in enveloping or covering grain and other seeds (previously to being placed in arable land) with substances suitable to assist the growth of the germ, such as charcoal reduced to an impalpable powder, guano equally pulverized, or any other organic or mineral matter giving by their analysis oxygen, hydrogen, carbon, azote, phosphoric acid, sulphuric acid, magnesia, oxyd of iron, chlorine, potash, soda, and all or any of the other substances which may serve to the nutrition of the plant." The corn or grain is placed in a cylinder, which receives rotary motion, by means of toothed or other wheels and an endless chain or band, from a shaft, which may be worked by hand or other power; the corn, as the cylinder revolves, is sprinkled with either of the following solutions;—"A clean gelatine of bones reduced to a siccative paste," "a solution of horns, feathers, and hairs of any sort, making a fat body," or "any other agglutinative matters containing fertile substances." "The operation of sprinkling the corn with one of the above solutions being finished, the motion of the cylinder is continued, and the pulverized matter prepared for the effect is put over the grain until it is covered with the said powder. The rotatory motion of the cylinder is to be continued until the powder has adhered to the grain, and is perfectly dry, which is caused by a current of air passing through the cylinder," at openings through the centre of the same; "or the cylinder may be placed in a heated room or stove." The patentee says, "I do not confine myself to the precise details of arrangements which I have had occasion to describe, as many variations may be made therefrom without deviating from the main features of my invention."

[Printed, 6*d.* Drawings.]

A. D. 1857, January 17.—No. 148.

REEVES, ROBERT, and REEVES, JOHN.—“Improvements  
“ in machinery for delivering manure for agricultural pur-  
“ poses.” The manure is placed in a box or trough, formed  
with a curved bottom, wherein any number of openings may  
be made for the passage of the manure. “At the lower part  
“ of the box or trough a rotating axis works, and on this axis  
“ there are fixed inclined blades or portions of screws, such  
“ blades or portions of screws being each of such a width as  
“ to move the quantity of manure desired. “And the pecu-  
“ liarity of the invention is, that the inclined blades or portions  
“ of screws which are to bring up or move the quantity of  
“ manure to an opening are inclined to the axis in opposite  
“ directions. The manure, after it has been caused to pass  
“ through the openings of the trough or box, may be depo-  
“ sited or distributed on or in the earth, as heretofore, or in  
“ any other convenient manner.” The invention is shown in  
the drawing as combined with a seed sowing machine; the  
manure box is fitted in front of the seed box, and the distri-  
buting shaft therein, which is driven through gear from the  
travelling wheels, has a series of the before-mentioned blades,  
“ inclined in opposite directions, so as to drive the manure  
“ towards the holes from the spaces between them, and over  
“ each of the holes four blades are mounted, two inclined in  
“ one direction and two inclined in the other direction, by  
“ which the manure over the holes is kept in constant move-  
“ ment backwards and forwards.” A slide, by means of which  
the holes in the box can be closed to a greater or less extent,  
in order to regulate the discharge of manure, extends the  
whole length of the box.

[Printed, 10d. Drawing.]

A. D. 1857, January 20.—No. 168.

KIENTZY, VICTOR AROUSTIN.—“Improvements in machinery  
“ to be worked by steam or other power for clearing and  
“ ploughing land.” A portable or other suitable motive  
power engine, having broad wheels, or else made to run over  
jointed chain rails, “or otherwise supported to travel over the  
“ ground by self-locomotion,” is employed in connection with  
the said machinery. “Power is communicated to the driving

“ wheels of the carriage by means of chain and chain wheels, power being also communicated by similar means to crank shafts, which immediately actuate the instruments to operate on the soil. For this purpose two crank shafts are disposed parallel to each other across the breadth of and in the rear of the machine, the one shaft being a little in the rear of the other.” The cranks opposite to each other on the shafts are connected by bars or rods, which carry “digging tines, hoes, coulters, or any other clearing tools suited to the state and nature of the soil,” so that, on rotary motion being directly imparted to one crank shaft, every part of each connecting rod performs a circular motion in which the tilling instruments participate, whereby they are caused to enter the “ground and throw up the earth in a backward direction;” the cranks being so arranged round each shaft that the rods rise or fall alternately, and, by thus acting in succession, cause the strain on the machine to be uniform. “The digging instruments may be separately arranged by their fixing to the carriers to penetrate the ground the required depth, or the driving crank shaft may be elevated or depressed bodily, so as to elevate or depress one end of the instrument carriers.”

Another arrangement is described, wherein cams are mounted on the driving shaft of the tilling apparatus, and frames carrying the tilling instruments are furnished with trucks or rollers, on which the cams take effect, and thereby force the tilling instruments into the soil; while cranks on a rotating parallel shaft throw the frames in a backward direction, and thus complete the digging process.

“Instead of cranks on the carrier shafts,” “eccentrics may be used, or any other mechanical means, whereby the circular movement may be imparted to the carriers and the tilling instruments.”

[Printed, 10d Drawing.]

A.D. 1857, January 21.—No. 175.

CHAMBERLIN, HENRY, junior.—“Improvements in implements or apparatus for ploughing, tilling, or cultivating land.” “This apparatus may be drawn by horses, steam, or any suitable power.” It consists of a screw or screws of

" a diameter large enough to cultivate the earth to a sufficient  
 " depth. This screw consists of one or more leaves or blades  
 " wound round an axis on which it rotates ; it is supported at  
 " each end by bearings from suitable framework, travelling on  
 " wheels over the ground in the direction of the length of the  
 " axis of the screw or screws. The screw may either consist  
 " of one or more threads involving a whole turn of the screw,  
 " or of sections or portions of more or less than a whole turn  
 " of the thread, and may be of the same or of a different rake  
 " or pitch. This screw being drawn through the earth in the  
 " direction of the length of its axis, it is caused to rotate,"  
 and at the same time to break up the soil. The screw axle  
 bearings, the foremost of which forms a coulter for the purpose  
 of cutting the ground in advance of the screw, are supported  
 by a screw frame, which is suspended from an upper frame on  
 travelling wheels by four racks which take into pinions where-  
 by the screw frame and screw can be adjusted. Instead of  
 placing the screw on a shaft, "the boss may be cast solid,  
 " and furnished with the necessary pivots or journals at each  
 " end ;" or instead of threads of screws on the shaft, the  
 leading part of the screw alone may be made smooth, in  
 order to cut into the ground and cause the shaft to rotate  
 while "tines or prongs set in a spiral direction or otherwise  
 " round the screw axis" may be used for the purpose of break-  
 ing up the soil. "One or more such screw shafts may be  
 " disposed in the same travelling frame," "and arranged  
 " either to be inserted to the full diameter or only to partially  
 " enter the ground." The patentee claims as his invention  
 " the adaptation and application of screw leaves, threads, or  
 " blades in combination with other screw leaves, threads, or  
 " blades of a different rake or pitch, or with other parts, for  
 " tilling or operating on the soil."

[Printed, 10d. Drawings.]

A. D. 1857, January 26.—No. 231.

HAMILTON, FRANCIS, BURRELL, CHARLES, and BOYDELL,  
 JAMES.—(*Provisional protection only.*)—"Combining ploughs  
 " with locomotive engines."

The following is the whole Provisional Specification :—

"This invention has for its object improvements in com-  
 " bining ploughs with locomotive engines. For these pur-

“ poses several ploughs are used at the same time, and they  
“ are connected to the locomotive engine in such a manner  
“ that the last of the series of ploughs may be still drawn  
“ forward up toward the headland whilst the locomotive engine  
“ is turning at the headland. Each plough is made with a  
“ single handle, and the depth of ploughing is governed by  
“ a wheel or wheels to each plough. In order that one man  
“ may guide two ploughs, the ends of the handles of two  
“ neighbouring ploughs are made to terminate opposite each  
“ other. The series of ploughs (used at one time) are con-  
“ nected by the fore ends of their beams to a bar which is at  
“ all times held in an inclined direction to the back of the  
“ locomotive engine, by reason of such bar being connected  
“ at one end thereof by a long chain or links, and at the other  
“ end by a short chain or links to the whippetree. The  
“ whippetree is connected at the middle of its length to the  
“ hinder part or back of the locomotive engine, in such manner  
“ that it can be drawn thereby, either when parallel or at an  
“ angle to the back of the locomotive engine; by which  
“ arrangement when the locomotive engine has arrived at the  
“ headland and is turning, it will still continue to draw forward  
“ the hinder ploughs, though the first of the ploughs have  
“ come up to the headland. To facilitate the working of  
“ several ploughs one after the other, the beams of each pair  
“ or it may be more, are connected by two connecting rods  
“ and pin joints to each other.”

[Printed, 4d. No Drawings.]

A.D. 1857, January 30.—No. 285.

**WILLIAMS, JOHN ALLIN.** —“ Apparatus for ploughing or  
“ tilling land by steam power.”

The invention principally relates to improvements in steam engines and hauling drums, also to methods of arranging the same. These are subjects not included in the present series, but the inventor also proposes to guide the cultivating implement “ by means of a horse placed in shafts in front of the implement,” “ the end of the hauling rope being attached to the frame of the implement in any convenient manner, so as not to interfere with the horse.” “ In the case of a ‘one-way’ plough or cultivator however, a horse will not be required



" for the purpose of guiding it." If "one-way" ploughs, &c. are used, the hauling drums, &c. (of which there are two) are kept opposite each other, the return rope being drawn out by its being attached to the tail of the implement. The hauling apparatus are made to traverse along the headlands by drums winding up ropes. "When a combination of right-handed or "ordinary ploughs is used" the inventor proposes to "plough the field in 'lands' of about twenty strides in width." The implements are moved along the headlands as required by a horse. As the hauling drums are not opposite, the return rope is carried out across the field by a horse.

[Printed, 2s. 2d. Drawings.]

A.D. 1857, January 31. — No. 296.

DRAY, WILLIAM.—"An improvement in ploughs." "My invention," the patentee says, "relates to such ploughs as are provided with a share in the form of a pointed bar, and consists in the means of pushing the bar forward when necessary from the wearing away of the point thereof, and securing it in its position. On one side of the bar I fit a spindle or rod with an eccentric formed or cast thereon which eccentric moves in a recess. By turning the spindle so as to bring the eccentric against the side of the share bar it is held tight, and by turning the eccentric the reverse way, that is, into the recess, the share bar is liberated, and may be moved forward to the extent required and there fixed by turning the eccentric against it." In the drawing, the said recess is shown as cast or formed in the side of a hinder bar of the plough frame, which bar descends from the beam to the ground of the plough; in the recess an eccentric roller or collar, having its journals turning in bearings one on each side of the recess, is inserted before the share bar is put into its place, that is, through dovetailed grooves in the front or main frame and in the said hinder bar. A projecting end of the hinder journal is made square, so that it can be turned by a spanner or key, whereby the eccentric roller is caused to jam the share bar firmly in the said groove. The inventor claims "the construction of ploughs which are provided with moveable share bars in such manner that the share bars can be tightened or slackened by means of an eccentric roller or collar, or by more than one roller or collar."

[Printed, 6d. Drawings.]

A.D. 1857, February 5.—No. 334.

SMITH, HENRY.—(*Letters Patent void for want of Final Specification.*)—"Hay-making machinery."

The following is the whole Provisional Specification:—

"This invention relates to an improved mode of obtaining  
"the reverse action in hay-making machines, the object being  
"to prevent the necessity of sliding any of the gearing wheels  
"on their respective shafts, and thus to remove the tendency  
"of the gearing wheels (which they possess when mounted so  
"as to slide) working out of gear and giving the machinery a  
"lateral strain. On the tine barrel axle I mount loosely a  
"spur pinion, which is always in gear with the driving wheel  
"on the axle or boss of one of the running wheels. To this  
"loose pinion I attach clutch teeth, and on the same axle I  
"fit a hollow axle, which is connected to the tine barrel;  
"mounted loosely on the hollow axle is a second spur pinion  
"provided with clutch teeth, and on the hollow axle is a  
"feather on which slides a clutch box for locking into the  
"clutch teeth of one or other of the two loose pinions. A  
"double pinion, the arbor of which turns in bearings pro-  
"vided for it on the frame of the machine, gears into the  
"driving wheel and into the loose pinion on the hollow axle.  
"The driving motion may thus be conveyed through either  
"of the loose pinions to the tine barrel by merely sliding the  
"clutch box to the right or left; or when in an intermediate  
"position the tines may remain stationary. The like effect  
"may be produced with the use of bevil gearing; a clutch  
"box throwing into and out of action one or other of a pair  
"of bevil pinions gearing into the upper face of a double crown  
"wheel, which is itself driven by a bevil wheel on the axle  
"or boss of one of the running wheels of the machine."

[Printed, *ed.* No Drawings.]

A.D. 1857, February 17.—No. 470.

NAYLOR, JOHN.—"Improvements in horse hoes." The main frame of the machine is carried by travelling wheels, and drawn by shafts. On a shaft or axis, placed across the machine on pendent supports carried by an upper bar, which is suspended by means of slings from the fore part of the frame, are placed a series of tubes, which turn freely thereon, and each of which

is embraced by a socket. To the under part of each sliding socket is affixed the end of a lever, which extends backwards for the purpose of carrying a hoe or cutter, and is supported by a wheel. Each lever has a vertical arm near its hinder extremity forming the bearing of an axis, which has at one end a handle by which it can be turned, and at the other end a pinion, which turns in a recess formed in the upper part of each of the said sliding sockets, and gears with the teeth of a rack formed on the upper surface of each tube, whereon the socket slides, whereby "the position of the lever of any of " the hoes may be moved to or from its neighbouring levers " on either side." The whole of the levers and bars are capable of being moved laterally by means of a pinion, which acts upon a curved rack on the upper side of the bar which supports the tube axle. The depth to which the hoes or cutters shall work is regulated by means of chains, which support all the said axes carried by vertical arms on the hoe levers, and by which they are connected to a roller, actuated by means of an axis and bevil pinions. The inventor makes no claim to any of the mechanical parts separately nor does he confine himself to the details, but what he claims is "the " combination herein explained."

[Printed, in Drawings.]

A.D. 1857, February 20. —No. 497.

**BROOMAN, RICHARD ARCHIBALD.** —(*A communication.*) —(*Provisional protection only.*) — "Steam digging apparatus " suitable for draining and excavating purposes, parts of " which are applicable to reaping."

Improvements on No. 1151, A.D. 1853.

1. "Placing running wheels behind the furnace for the " better adjustment of the weight."
2. "Forming the wheels with a sheet-iron felloe, bolted or " rivetted to flat or T iron spokes, shaped like a truncated " isosceles triangle converging to and supported by the " nave."
3. "Dividing the nave" of the wheels "into two parts, so " that the wheels may slightly incline on the axle."
4. "Leaving a certain amount of play between the nave and " axle."

5. Throwing the running wheels out of gear by clutches so that one wheel may be thrown out of gear without stopping the revolution of the axle.
6. "Modifying the arrangement of gearing for driving the fore-carriage wheels simultaneously with the large motive or running wheels; by employing bevil wheels mounted on a shaft gearing into other and corresponding bevil wheels; placing a chain wheel on the centre of axle, and providing chain wheels supported by couplings and cotters."
7. Placing guards on the peripheries of the motive wheels.
8. "So arranging the axle of the fore carriage that it may follow the the undulations of the soil," by "surrounding the axle by clutches against which press springs connected to a shaft with pins or studs carrying a beam which is bolted to stays or bars fitted under the lower platform."
9. "Employing steam to tilt or incline the fore-carriage in working a curve or turning the machine."
10. "Connecting in a straight line the digger, frame, or carrier, and the framework of the engine."
11. "So arranging the digger shaft that it may be moved nearer to or further from the soil without interfering with the other parts of the machine."
12. "Effecting the up and down action of the diggers by cams and connecting rods, by toothed wheels or by cranks and levers."
13. Employing a stop on the frame "to regulate the back stroke of the diggers, elastic meshes being provided to break the force of the shock."
14. Employing two diggers "of different lengths placed at a greater distance from each other than the thickness of the strip of soil to be loosened."
15. Employing three or more diggers similarly arranged.
16. Applying the machinery for excavating canals and drains.
17. "Mounting forks or teeth behind the engine drivers seat, or the digger carrier, to pulverize and break up the earth."
18. "Employing fixed cylinders instead of oscillating cylinders with connecting rods for transmitting the action of the piston to the levers which carry the digging shaft."

19. "Dispensing with one of the shafts which carry the  
"gearing wheels."

20. "Applying the apparatus for reaping by employing  
"reaping apparatus in place of diggers."

[Printed, 4d. No Drawings.]

A.D. 1857, February 23.—No. 531.

MAISSIAT, JACQUES HENRI MARIE. — "Improvements in  
"dibbling machinery for depositing grain and manure." A  
hollow cylinder, which rolls on the ground, is constructed with  
projecting ridges on its exterior, for the purpose of "tracing  
" (in the manner of an impressing cylinder) the furrows or  
"cavities in the soil where the seed and manure are to be  
"deposited at regular intervals, and in quincunx arrange-  
"ments." In the interior and at the bottom of the hollow  
cylinder is a supply of seed, which, during the revolution of  
the cylinder, is continually rolling on itself, and which is mea-  
sured and introduced, by cups projecting inside the cylinder,  
into chambers or seed hoppers, whence it passes into the  
ground. These cups have "moulded or shaped cavities,"  
"which have the exact form of the grain to be sown, so that  
"as many grains may be lodged in them as there are cavities,  
"and the cups can be changed, or a certain number dispensed  
"with, when required." Each cup is charged by traversing  
the seed, and discharges its contents, through a valve, which  
opens by its own gravity during the rotation of the cylinder,  
into the said chamber or seed hopper; the valve has two guide  
grooves formed of pieces, soldered back to back on both sides  
of the valve, and acting alternately on the grain to conduct it  
first into the cup and then into the chamber. "The move-  
"ment of the valves of the same row of dibbles depends upon  
"the torsion or twisting of a wire, which acts as a substitute  
"for a hinge." Each chamber or seed hopper is funnel-  
shaped, and terminates in a channel, forming a given angle  
with the funnel-shaped part. The seed, by the continued  
rotation of the cylinder, passes down this channel and through  
an exit valve into the ground; the exit valve consists of a  
curved metal blade, attached to the exterior of the cylinder at  
a distance from the exit opening, and this opens by its own  
elasticity when relieved from the pressure of the cylinder on

the ground, the movement of the exit valve being further assured by a little spring, placed in a cavity at the exit opening, which "assures the movement and exact displacement required for the passage of the seed." "The seed therefore is not deposited until the roller has passed over the point of deposit, the exterior valve closing and preventing its escape till that time."

"For depositing manure simultaneously with the seed," the inventor says, "I place a second cylinder within the first in which the manure is placed. This second cylinder is furnished with valves and parts as before described with reference to the seed cylinder. The channels for the passage of the manure from the inner cylinder lead into the seed channels of the first, by which the manure escapes with the seed into the dibbled hole prepared for its reception." For admitting guano and grain into their respective cylinders, there is an opening formed in the end of each cylinder.

For depositing liquid manure, a removable reservoir is placed on uprights connected with the apparatus, and forms a platform for a sack of grain and a sack of guano, and also a grated funnel for the admission of the liquid manure. The liquid passes from the reservoir through tubes, and is distributed by "a tube forming a syphon, and pierced with as many holes as there are furrows."

[Printed, 8d. Drawing.]

A.D. 1857, March 4.—No. 636.

NEWTON, WILLIAM EDWARD.—(*A communication.*)—"Machine for cutting standing crops." Motion is given to the cutters as follows. The large running wheel is solid, and has on its face an angular groove. A rod, sliding in bearings parallel with the face of the wheel, has on it a short arm carrying a friction roller running in the groove. By these means a reciprocating motion is given to the rod, and this is transmitted through a bell crank to the cutters. A plate fits over the lower part of the wheel, to keep the groove from being clogged by earth, &c. The sliding bar can be disconnected from the lever when the cutters are not required to work.

[Printed, 8d. Drawing.]



A. D. 1857, March 16.—No. 736.

THOMSON, JAMES.—(*A communication from William Thomson.*—“Mowing and reaping machines.”)

The cutters are “star-shaped,” and are pivotted along a bar in front of the machine which is drawn by horses in front of the large running wheel, &c. They are vibrated by their hindermost teeth or arms being pivotted to a rod which receives a reciprocating motion from an eccentric driven from the large running wheel. The throw of this eccentric can be varied by altering the position of its connecting rod in a groove therein. When the front teeth of the star-shaped cutters are worn they can be reversed, and those that were before pivotted to the reciprocating bar can be brought into action. These cutters act between fingers, arranged above and below the cutters, one pair of fingers between every two cutters, and one pair at the centre of each cutter. The edges of the cutter teeth are serrated. When the machine is used for cutting corn, a gatherer and a platform or “apron” are used. When it is cutting grass these are dispensed with. The cutter frame is raised and lowered by means of a screw.

[Printed, &c. Drawings.]

A. D. 1857, March 18.—No. 768.

LEWIS, JOSEPH.—“Apparatus for reaping and mowing.”

The cutter consists of an endless elastic steel band mounted on rollers. The edge may be serrated. Various methods may be adopted for giving motion to this cutter. In the one described at length in the Specification, the endless band passes over a drum on horizontal axis at right angles to the main axle-tree, and also over two small rollers, one on a level with the top, the other on a level with the bottom of the drum. The band is thus extended over a figure of which one end is rectangular, and the other end formed by the section of the drum. The lower side of this figure is the part of the cutter actually in action. Here it passes between two plates of sheet iron forming a “sheath.” The upper smaller roller can be adjusted, for the purpose of tightening the band. The above method may be employed when the machine is of the form drawn by a horse in front, with the cutter frame projecting at one side. As modifications of this, the band may pass over a

single small roller at the end of the outer frame and with other small rollers over it, so that both the upper and lower part of the band may be contained in the "sheath," or one in the "sheath" and the other immediately below it.

When the machine is of the sort impelled by being pushed from behind, "the rollers are set in an angular direction, the bottom edge of the belt knife standing considerably in advance of the rollers and pulley, so that the ordinary end-less sheet delivery may be used."

Instead of an endless band, an endless chain carrying cutter blades may be used. This is to be mounted as in the first described arrangement, so that "it shall travel upwards as it leaves its work and pass over that part of the said band or chain which is then in operation."

[Printed, 10d. Drawing.]

A. D. 1857, March 24.—No. 825.

LAWES, THOMAS.—"An improved construction of agricultural implement to be used in tilling the land." This invention, which has reference to an improved method of raising or lowering the tine cylinder employed in connection with the usual mechanism for digging or tilling the land, "consists in the tine cylinder being supported horizontally on suitable running wheels mounted eccentrically upon the outer ends of the shaft on which the cylinder revolves through the intervention of cranks," eccentrics, segment racks, chain levers, or otherwise in such manner, that by the employment of ordinary screw and pinion gear, or spiked wheels and endless chain, "in connection with the framing, the said cranks on which the wheels are mounted may be actuated in either direction at pleasure, in conformity with the mode of lifting or lowering the apparatus. The tine cylinder may be formed and mounted in one or several parts, running separately or together, as may be required, and arranged side by side on the shaft, either closely together or with intervening spaces, the peripheries thereof in either case being provided with fixed or shifting tines, and surrounded with an outer case or cylinder (of greater dimensions than the inner one, upon which the tines are fixed,) furnished with openings or perforations, corresponding with the number and size of the teeth or tines on the lesser cylinder, which moves eccentrically.

"cally within the outer one, so that the teeth or tines  
 "may be readily cleaned by their being drawn in or out  
 "through the perforations, consequent upon the eccentric  
 "action of the inner cylinder." The inventor does not confine  
 himself to the precise details, as described, but he claims  
 as his invention "the general construction and arrangement  
 "of machinery or apparatus for raising the tine cylinder of  
 "agricultural implements" as described.

[Printed, 6d. Drawing.]

A. D. 1857, March 25.—No. 829.

MICKLE, JOHN.—(*Provisional protection only.*)—"Appa-  
 "ratus for reaping and mowing."

Motion is given from the bearing wheels of a frame propelled  
 by manual or other power to a reciprocating horizontal cross  
 bar. "To this cross bar are attached parallel rods connected  
 "at their further extremities each with four levers, forming a  
 "rhomb, whose angles, by the reciprocating motion of the  
 "cross bar, become alternately acute and obtuse, and give an  
 "oscillatory motion to the double-edged cutting knives or  
 "shears which form the far arms of two extreme levers of the  
 "rhomb." There are also "projecting from the sickle boss  
 "guide cutters, to prevent the squandering of the grain."  
 "Also a receiving board, which shall deliver the grain on one  
 "side by self-action or by means of a rake, revolving or  
 "suspended. When applied as a mowing machine the cutting  
 "knives are depressed by means of a screw or other arrange-  
 "ment, and the receiving board changed for one adapted to  
 "the purpose."

[Printed, 4d. No Drawings.]

A. D. 1857, March 31.—No. 884.

FRANCIS, HENRY.—(*Provisional protection only.*)—"Ma-  
 "chinery for ploughing and working land."

The following is the whole Provisional Specification:—

"The improvements consist in working ploughs, sub-soil  
 "ploughs, scarifiers, drillers, rollers, and other implements  
 "used in agriculture, by attaching them separately or collec-  
 "tively to a locomotive or other engine constructed so as to  
 "travel on the land by its own motive or other power, and

" which engine moves the implements horizontally and transversely to the direction of its progress by means of a lever or beam working on a fulcrum beneath the body of the engine, the implements being attached to the outer end of the lever or beam which projects beyond the wheels carrying the engine, and to which lever or beam a vibrating motion is communicated. Other arrangements and combinations of levers and cranks may be used to effect the above objects, that is to say, to give a horizontally vibrating reciprocal motion to the implements transverse to the directions in which the engine is travelling. The working depth of the various implements attached to the lever or beam is to be adjusted by screws or other mechanical means, and by similar means provision is made for raising the implements above the ground."

(Printed, 2d. No Drawings.)

A.D. 1857, April 1.—No. 904.

WARDELL, ROBERT.—Reaping machines.

Behind the cutters is a "flattened conical shaped endless kind of belt" over rollers radiating outwards from a point at one end of the cutter frame. This receives the cut crop from the cutters, carries it round through a quarter of a circle, and delivers it between a pair of rollers from which it passes to an endless band running in a direction parallel to the course of the machine. This deposits it in a receptacle through which a set of curved prongs on one side of a rotating shaft work so as to lift the corn that has collected in the receptacle and throw it out of the machine in a sheaf ready for tying.

The delivery rollers are driven from the large running wheel, and they drive the rollers carrying the first endless band. This is supported on rollers the ends of which are formed with flat sides to correspond with flat metal pieces along the edge of the band. There are also friction rollers to keep the band in its place. Along the side of the apparatus near the standing corn a channel is formed, into which all corn hanging from the machine is pushed by the standing corn. From this channel it falls on the endless belt, and is by it carried off with the rest of the corn. A "tail-piece," which trails on the ground, is connected to the "universal or following wheels," to prevent

their "twisting about from side to side." The "axes or "centrea of motion" of the delivery rollers are set "out of a "vertical line," "by which the heads of the corn," &c., "are "kept well up whilst passing between said rollers."

When it is not required to deposit the corn in sheaves, the second endless band and the sheaf-forming apparatus are not used, and the corn is deposited by the rollers on sloping boards which guide it to the ground.

[Printed, 10d. Drawing.]

A.D. 1857, April 2.—No. 918.

OTWAY, ROBERT.—Scythes.

The objects of the invention are :—

1. To enable the blade "to be set at any required angle "with the ground."
2. To enable "the position of the blade with respect to the "handle to be altered."
3. To enable the blade to fold in a line with the handle.

It "consists in the employment of a plate centred upon "a pin connected to or passing through a metal bar screwed "to the scythe handle or snath. Near the inner end of this "plate there is formed a curved or arc'd slot or quadrant "through which a screw is passed to set the plate to the "handle or snath." The head of the screw is square or other suitable shape. "The bottom end of this plate is "turned up, and has an eye formed through it, and this eye "is at right angles or nearly so to the main surface of the "plate. The end of the scythe blade to be connected through "this plate to the handle is turned up, and has also an eye "formed in it. By bringing the eyes together and in a line "with one another, and passing a screw whose square head "rests through a washer upon one of the eyes, and tightening "it up, the connection between blade and plate will be made." By loosening the screw "the angle of the blade with the earth "can be altered." "By loosening the screw which connects "the plate to the handle and working the plate more or less "round upon the screw, the position of the blade with respect "to the handle can be altered."

[Printed, 6d. Drawing.]

A.D. 1857, April 4.—No. 952.

HARVEY, JOHN PENFORD.—(*Provisional protection only.*)—  
"Improved machinery for crushing land or clods." The  
invention "consists in mounting two, three, or more sets of  
"discs (with corrugated or indented edges) on one common  
"shaft, each set of discs being independent of the others.  
"The individual discs of each set are all mounted loosely on  
"the shaft, but they cannot revolve independent of each  
"other, as they are all connected together by loose clutches,  
"which will, however, admit of their having a separate  
"motion of about half an inch or so on the shaft for the sake  
"of enabling them to clear away clods or earth that may  
"stick in the interstices between the discs. The discs are  
"arranged in such a manner on the shaft that the projections  
"of each are opposite to or in front of the indentations of  
"the adjoining ones." "The shafts of the implement are  
"also bent and adapted to the roller in such a manner that  
"the line of draught may be from the axle of the roller to the  
"horse's shoulder instead of being allowed to press on his  
"chest."

[Printed, &amp;c. No Drawings.]

A.D. 1857, April 8.—No. 991.

NEWTON, ALFRED VINCENT.—(*A communication.*)—"Ma-  
"chinery for cultivating land."

"The frame of the machine is mounted on running wheels,  
"the foremost one of which is a guide wheel, and is provided  
"with spur projections to take a good hold of the ground.  
"Rotary motion is communicated to this wheel from the main  
"driving shaft by an arrangement of gearing that will permit  
"of its being turned in the plane of its axis to guide the  
"machine without interfering with the driving of the wheel.  
"Oscillating or other steam cylinders, mounted on the frame,  
"may be used to give motion to the main shaft, and this  
"motion is communicated by gearing to an adjacent eccentric  
"shaft. Around the eccentrics of this shaft (corresponding  
"in number to the number of spades employed) are eccentric  
"straps, which are severally jointed to spring levers. These  
"levers at their outer ends are attached to rocking levers,  
"supported on a cross shaft carried by an auxiliary frame;



" this frame rocks on the cam shaft, and carries at its forward  
 " end the spades, which are set abreast of each other, and  
 " are severally jointed to arms mounted loosely on a shaft,  
 " having its bearings in the forward end of the auxiliary  
 " frame. These arms are operated by connecting rods  
 " pendent from the extremities of the rocking levers, and  
 " jointed to the arms, and by this arrangement the depression  
 " and lift of the spades is effected. But in order to give  
 " the spades the irregular or tripping action required for  
 " lifting and turning over the earth loosened by the spade,  
 " tripping levers are employed, which are pressed into contact  
 " with the cams on the cam shaft, and at their lower ends by  
 " bent rods with the head of the spades; the rotation of  
 " these cams, therefore, will rock the trip levers, and so cause  
 " the spades to rock on their fulcrums. As the shoes of earth  
 " are carried up by the spades, they are thrown against a  
 " shield plate, attached to the cross piece of the auxiliary  
 " frame, and by that means broken up or turned over. The  
 " spades follow each other in their action to equalize the power  
 " expended, and a yielding pressure is put upon them to  
 " prevent injury to the machinery.

" In order to lift all the spades from the ground simul-  
 " taneously, when the machine is to be thrown out of action  
 " studs are fixed on the sides of the auxiliary frame, and a  
 " pair of cams mounted on the main frame is made to act  
 " on these pins and lift the rocking frame which carries the  
 " spades."

[Printed, 8d. Drawing.]

A. D. 1857, April 11.—No. 1022.

ROBINSON, JOHN BLYTHE.—(*A communication.*)—(*Letters Patent void for want of Final Specification.*)—"Apparatus  
 " for effecting agricultural operations."

Improvements on No. 1151, A. D. 1853; No. 35, A. D. 1855  
 (with Memorandum of Alteration appended thereto); and  
 No. 2121, A. D. 1856.

The invention consists of a locomotive boiler mounted on a  
 frame on wheels, the axle of the main bearing wheels being  
 hollow and passing "either through or under the shell of boiler;"  
 it has also the wheels running loose thereon. "A shaft passes  
 " through this hollow axle, and is connected at each end and

"outside the framework, by means of cranks and side rods, to one or more steam engines placed on the top of the boiler; and this shaft is also connected to the digging cylinder by the same means." The engines may also be otherwise arranged. The machine is steered by power from the engine, and the digging apparatus raised and lowered in a similar way. The gearing of the "digging cylinder" is covered in. The digging cylinder may be driven from the main crank shaft. Gearing is arranged "capable of driving the two main supporting wheels simultaneously in opposite directions." These wheels may be driven "by means of annular or spur wheels, of less diameter" than those previously used "attached to one side of such supporting wheels." The digging cylinder has attached thereto "one or more rollers or wheels" "so as to enable it to maintain a proper and uniform depth in the soil, and accommodate itself to the inequalities of the land." "Suitable instruments of forming drills or furrows and for harrowing" are connected to the back of the machine. "Digging knives or cutters of peculiar form" are used. "Endless railways or detached part of rails" are fitted to the wheels, as are also "skids or shoes" "for obtaining a greater bite or friction on the ground."

[Printed, 4d. No Drawings.]

A. D. 1857, April 15.—No. 1068.

PAYNE, JAMES.—Scythes.

The handle "is of the duplex kind" or forked with a short handle or holding piece at the end of each part. These are adjustable by "screw-clipping holders" loosened and tightened by turning the handles themselves. At the end of the long handle is a metal collar with a cross piece "tapped through at the centre, to receive the screwed end of the connecting bolt." The cross piece is "notched or serrated on one side for the purpose of receiving corresponding notches or serrations on the inside face of a metal cap, through a hole in the centre of which" the screw bolt is passed. "This cap forms the butt end piece of the snath, and when the scythe is fitted for use it is screwed hard up against the butt end of the snath by the central bolt, the serrations preventing it from turning round." The cap "has forged

" upon it a short angular limb or connecting piece, having an eye at its opposite lower end for forming the connection with the scythe blade." "This is effected by a short stud piece having at one end a flattened side, bearing against the under side of the heel," to which it is attached by a screw. "The other end of this short stud piece is screwed and entered through the eye of the limb of the butt end cap, where it is fastened by a nut." There is also a stay or rod hooked to a hole in the blade and secured to a collar on the handle which can be fixed at the required part of the handle by a screw. To gather the mown grass, &c. a "gatherer or 'cradle'" is attached to the scythe. This consists of a light metal frame with two or more arms parallel to the blade, and a cross piece jointed to the handle by a curved link at its upper end, and fitted to the cap on the handle at its lower end.

[Printed, 2d. Drawing.]

A.D. 1857, April 23.—No. 1153.

CAMBRIDGE, WILLIAM COLBORNE. — "Improvements in 'chain harrows.'" In this invention, the harrows may be attached to the traction bar by a series of long links, or "one, two, or more of these long links may be removed, if desired, and dynamometers attached in their place." The several sections of the harrow, which sections are arranged breadthways, and may be made of links of different weight, are connected together, and are also kept distended, by flexible transverse bars, each of which is constructed of three or more lengths of iron rod twisted into something of the form of rigid chains; the several lengths of these twisted rods being jointed together, so as to form one long length the width of the harrow. "The implement will thus be kept expanded to its full width, but it will at the same time be allowed to yield laterally to any unevenness or inequality of the surface of the ground. The links composing the harrow are so arranged that one row of links will not follow the preceding ones in the same line, but will work between the lines formed by the preceding row of links." One of the said flexible transverse bars is fixed at the bottom or end of the harrow. The inventor does not confine himself to any particular form of link, nor to the particular form or mode, above

described, of constructing the flexible transverse extension bars, but what he claims as his invention is, firstly, "the use  
" and application of the flexible transverse bars " "for the  
" purposes above set forth;" and secondly, the "arranging the  
" several sections of the harrow in such a manner that the  
" vertical links thereof shall not run in the lines produced by  
" the links of the section immediately preceding."

[Printed, &c. Drawing.]

A.D. 1857, April 27.—No. 1186.

EDDINGTON, ALFRED.—"Improvements in machinery for  
" ploughing, tilling, and draining land." In this invention,  
" the drum or barrel used for working the wire rope," by  
" which the plough or tilling instrument is drawn, "turns on an  
" upright spindle fixed below a platform or frame, which is  
" supported by standards or framing on an under platform or  
" frame mounted on wheels or rollers. The lower platform  
" or frame carries an ordinary crab or windlass, by which the  
" drum or barrel carriage can be moved along a headland  
" towards an anchor or fixed point. The upper platform or  
" other part of the drum or barrel carriage is arranged in a  
" suitable manner to have a portable steam engine run thereon  
" by the aid of a temporary incline, and by the crab or wind-  
" lass; and such portable steam engine is, for the time being,  
" coupled with and moved along a headland with the drum  
" or barrel carriage. The power of the engine is communi-  
" cated to the axes or spindle of the barrel or drum by means  
" of suitable gearing; it is, however, preferred to have a  
" toothed wheel on the axis or spindle of the drum or barrel,  
" and a pinion on an axis receiving motion from a band or  
" strap driven by the steam engine. In working with such  
" machinery two barrel or drum carriages, such as are above  
" explained, are used (each carrying a portable steam engine),  
" one to each headland, and the ploughs or other implements  
" are drawn simultaneously in parallel lines to and from the  
" two barrels or drums, by which arrangement or construction  
" the portable engine and the drum or barrel carriage, though  
" independent when out of use, are so constructed that when  
" in use they are coupled together, and by moving the one  
" along a headland the other is moved at the same time."

"When the machine is used for draining land it is placed at or near the end of the drain to be made, and by winding its hauling rope on to its drum," "it draws the drain plough directly towards itself."

[Printed, &c. Drawing.]

A.D. 1857, May 11.—No. 1328.

HALL, COLLINSON, and CHARLTON, THOMAS.—"Agricultural engines and implements used therewith for ploughing and cultivating the soil."

The greater part of this Specification is occupied with improvements in a locomotive agricultural engines. The "improvements in implements consist in connecting ploughs, or frames of ploughs or other implements for tilling the soil, both before and behind a locomotive engine, and providing them with the means of being thrown into and out of work." Also the "connections are so managed and arranged that while the implements continue to travel in a straight line, the engine on approaching the lands' end is steered on to fresh land for the returning of engine and implements." In the plan shown in the drawing, there are two sets of implements attached to the engine at the side, one set acting in one direction, the other in the other. When nearing the headland the engine is steered out, the ploughs, &c. being still kept in the straight line, until there is a space between the engine and implements equal to the breadth of the strip of land treated by the implements at each traverse. The implements are then brought close up to the engine, and consequently on to unbroken ground, and the backward journey is commenced. No particular method of connecting together the engine and the implements is described. The inventors also say:—"In some cases we connect the implements rigidly to the engine to enable us to take advantage of the weight of the engine."

[Printed &c. Drawings.]

A.D. 1857, May 12.—No. 1342.

MASSEY, WILLIAM, and SMITH, JOHN.—"Improvements in machinery for ploughing and cultivating land." The invention has reference to machines in which "several ploughs or other implements are used simultaneously, either drawn or propelled by steam or any other power." The ploughs,

which "are so arranged that when at work they follow at certain distances from each other," are maintained at the proper distance apart, each plough having "an independent vertical and backward and forward movement," by means of guides secured to a strong frame or carriage. The regulation of the depth and width of the furrows is effected by means of a wheel, carried by a beam in connection with each plough. On the head of each plough is fixed a second beam, working through the guides, and forming an inclined plane. When the progress of the entire machine is stopped at the headland, the rope or chain, which has been drawing the same, is made to actuate a shaft, whereon are fixed toothed or other wheels, which give motion to a rack, chain, or screw, for the purpose of bringing each plough in a line to a stop on the frame; the said inclined plane "comes against the stop, raises the point of the plough or implement, and the onward motion of the rack, chain, or screw causes the incline plane to pass over the stop," and to "lift the implement from the ground, in which position it is retained by a catch till required for another furrow, thus leaving the headland unbroken, and the ends of the furrows well turned in ploughing turf or similar land."

Another part of the invention consists "in causing the wheels that support and guide the frame to be turned at right angles when the frame is stopped at the headland, so as to prevent the frame from moving backwards or forwards, but in such a form that it can move sideways to take fresh ground." The frame is carried upon four wheels, one at each end and two in the middle; the middle wheels, which are the regulating wheels, are hung on vertical arms attached to slides having a vertical motion for the adjustment of the wheels, one of which runs in the furrow, the other on the unploughed ground. The wheel arms are also "fixed on a lever or beam which vibrates from the centre of the frame, so that when the wheel that has been running in the furrow comes upon the headland, the lever or beam causes the frame to maintain its level, in consequence of the frame being balanced upon it."

As regards the invention, the patentees say: "We claim the peculiar mode of raising the ploughs or other implements out of the ground point, first, by means of the inclined plane, and the mechanism in conjunction therewith, and of



" maintaining them in a suspended position when not in work,  
 " together with the guides for keeping the ploughs in position  
 " when at work, and the peculiar construction of the frame, by  
 " which we are enabled to balance the entire implement and  
 " move it sideways."

[Printed, 10d. Drawing.]

A.D. 1857, May 20.—No. 1418.

**KNIGHT, THOMAS.**—(*Provisional protection only.*)—"Cut-  
 " ter and cultivator of land."

The apparatus as shown in the drawing consists of a frame in front of which a row of curved blades is fixed with their convex sides foremost. Behind these is a set of curved "cultivating teeth" with their points towards the front. Between these two sets of teeth is a small wheel on the end of an upright stem, to the top of which a lever is attached, by which the back set of teeth can be raised from the ground.

[Printed, 6d. Drawing.]

A.D. 1857, May 22.—No. 1443.

**HENSMAN, WILLIAM.**—(*Provisional protection only.*)—"Improvements in drills for sowing seeds and depositing  
 " manure."

"These improvements consist in supporting the seed box or  
 " manure box so as to enable it to assume a horizontal position  
 " when passing over inclined surfaces of land." "For this  
 " purpose," the inventor says, "I support the end axles of the  
 " box, which have a vertical and horizontal motion, in bear-  
 " ings, which are connected with a scale beam placed either  
 " above or below the box, whereby the box assumes and  
 " preserves a horizontal position whatever may be the inclina-  
 " of the land over which it is passing."

[Printed, 4d. No Drawings.]

A.D. 1857, May 25.—No. 1473.

**COGAN, HENRY.**—(*Provisional protection only.*)—"An  
 " improved adjustable connection or joint, particularly appli-  
 " cable to agricultural implements." "My invention," the  
 " patentee says, "consists in the employment of a threaded rod  
 " or screw bar fixed or connected to the frame or other suit-  
 " able part of the implement or machine, to which coulters,

" tines, shares, hoes, or other articles are to be joined or connected; and for as many of these as are to be so connected  
 " I pass on to the screw bar so many threaded tubular nuts,  
 " having an eye, tube, button, or other like projection formed  
 " thereon, to which the hoes, coulters, or other articles are to  
 " be united by bolt and nut or otherwise, so as to form a tight  
 " or hinge joint at will."

[Printed, *ad.* No Drawings.]

A.D. 1857, June 1.—No. 1546.

SLATER, THOMAS.—(*Provisional protection only.*)—" An  
 " improvement in ploughs." " The improvement consists in  
 " coating the cast-iron mould board and metal parts which  
 " enter and turn over the earth with glass or vitreous compound, by which the surfaces of such parts pass more freely  
 " through the earth."

[Printed, *ad.* No Drawings.]

A.D. 1857, June 9.—No. 1604.

BICKFORD, JOHN.—" Improvements in machinery for cutting  
 " gutters and irrigating land, and for cutting other surface  
 " drains or gutters." " The principal features of the machine  
 " are two parallel bars, one fixed to cross pieces at both ends,  
 " and the other sliding in grooves in the said cross pieces, so  
 " as to admit of the distances between the bars being increased  
 " or diminished. A rack, pinion, and winch, serve to adjust  
 " the arrangement and preserve the parallelism." The fore  
 " end of the frame is supported at any required height from the  
 " ground by two parallel wheels, the axis of one of which is fixed  
 " to the front cross piece, the axis of the other is fixed to the  
 " front end of the sliding bar, "so that the width between the  
 " wheels shall be more or less as the frame is expanded, or  
 " the contrary;" to the hinder end of the frame are attached  
 " handles, similar to those of a plough. "From the bars  
 " above described depend two vertical knives for cutting the  
 " sides, and two shares for cutting the bottom of the gutters."  
 " The knives are abreast, and are adjusted by means of screws."  
 " The shares, which cut the earth horizontally below the surface,  
 " respectively follow each knife, and the plates of these shares  
 " are so matched that when the machine is drawn in, the shares  
 " slip one over the other;" a small plate may be placed under

each share, "with a 'slop mortice,'" which plate "can be pulled out so as to widen the mouth of the share as much as is required to cut the work clean." A mould plate may be used with this machine, if required. "Two draught rods, which are attached one to the sliding rod, the other to the fixed rod, are united at an angle and by a joint to a single rod to preserve a central draught at any width, a pin being inserted in the rods to form a joint, and to allow the rod to work sideways horizontally to the right and left." Different arrangements of the rods, knives, and shares, may be made to cut various gutters. The inventor does not confine himself to the precise details of the machinery, nor does he claim as his invention any of the mechanical parts separately, but what he claims is "the combination of machinery, substantially as herein-before described, and shewn by the drawings, for the purpose of cutting gutters or drains, or any mere modification of such combination."

[Printed, 5d. Drawing.]

A. D. 1857, June 10.—No. 1631.

PUDDEFOOT, MICHAEL.—(*Provisional protection only.*)—"Mowing machines."

A "circular revolving frame" is mounted on a pair of running wheels "comprised within the limits" of the frame; and by these it is rotated through bevel gearing. The upper end of the spindle of the frame is mounted in a horizontal beam supported at its end by a third wheel, and by this beam the machine is propelled. Cutting blades, "in form somewhat like a reaping hook," are affixed round the lower edge of the frame. Of these six are preferably used for cutting grass, three larger for cutting corn. "The back part of each cutting blade is furnished with a light frame on which the cut produce falls." "At a certain part of the revolution" these frames "receive a tilt," which throws off the cut crop. Or a rotary brush may be used for delivering the crop. There is a "vertical knife at the point of each scythe or cutting blade, which cuts and separates vertically the amount of the crop to be cut." There is also a "separator" to separate the crop to be cut from the standing corn, &c.

[Printed, 4d. No Drawings.]

A.D. 1857, June 10. —No. 1638.

**NEWTON, ALFRED VINCENT**, —(*A communication.*)—Reaping machines.

The cutters consist of rotating discs with projecting radial blades. These are pivotted each on one of a pair of plates, hinged together end to end so as to allow for inequalities in the ground. These two plates are fitted in the front of the machine in place of the usual cutter frame. They are toothed in front, the teeth forming stationary fingers against which the rotating blades cut. The cutters are driven by a train of spur wheels, carried by the plates before mentioned, and so arranged that the movement of the hinge does not throw the wheels out of gear. The whole is actuated from a spur rim on the main running wheel. Behind the cutters is a platform over which an endless travelling apron works, to carry the cut crop to the back of the machine. A rake or bar is fitted to work across the apron at intervals and push the cut corn off therefrom. "This bar is jointed at its opposite ends to two swinging arms attached to the platform frame, and it is retained in its normal position by the tension of a spring." "A chain or cord" or rod "from the bar passes to a segment guide or curved box attached to back part of the main frame, and adjoining the periphery of the driving wheel, and a ball is fitted thereto to enter the box." A stop on the wheel "passes through the box and raises the ball," thus acting on the chain and through it on the bar or rake.

[Printed, &amp;c. Drawing.]

A.D. 1857, June 16. —No. 1682.

**FOWLER, JOHN, junior, and WORBY, WILLIAM**. — "Improvements in ploughing or tilling land" by steam or other power. The invention consists, firstly, in a "method of constructing the carriages for carrying the pulleys which traverse along the headlands as the ploughing or tilling progresses," by attaching to one side, or to both sides, of the carriage "horizontal shares, which pass through the land with comparative facility, but which offer great resistance to being drawn vertically out of the ground."

Secondly, in a method of drawing forward the anchor carriages as the work progresses. On the plough or tilling

instrument which travels over the land, to and from the anchor carriages, is mounted a small drum, on the periphery of which several coils of one or other of the hauling ropes leading in either direction are wound. "When the plough or tilling instrument arrives at one of the headlands, and what has been the return rope begins to be wound up, the first effect of the strain upon it is to unwind its end from the drum, and to wind up a similar quantity of what before was the hauling rope;" advantage is taken of this by hitching to this rope one end of another rope, passing round a pulley or block at some distance ahead of the pulley carriage, and the other end being attached to the pulley carriage, to draw the pulley carriage a step forward, while the unwinding is taking place from off the drum on the plough or tilling instrument.

Thirdly, in a method of preventing the plough or tilling instrument from rising out of the land, by "leading the traction rope over the end of the plough," or by hooking the rope on to a ring, suspended under the axle, and connected by chains to points over the ploughs or tilling tools and near the end of the frame, "so that when the strain comes on the rope it draws the end of the plough down, and tends to keep it in the land."

Fourthly, in the arrangement of the plough or tilling instrument; the same consists of two parallel beams, fixed firmly together, and supported at their centres by an axle mounted on wheels. "The beams carry at their ends and on their under surfaces, plates or bars having slotted holes in them, to allow of the ploughs, tynes, or cutters being bolted to the plates or bars at any required distance the one from the other."

Fifthly, in combining with a locomotive engine (such as is described in the Specification of a former Patent, dated July 10, 1856 No. 1635), having drums combined with it, on to and off which drums the traction rope is wound, "an additional winding drum," capable of being thrown in and out of action, "to assist in moving the engine in places where the land is so uneven or bad that there is difficulty in moving the engine forward by gearing the carrying wheels."

[Printed, 1s. 6d. Drawings.]

A.D. 1857, June 18.—No. 1707.

CHARLWOOD, GEORGE WASHINGTON.—(*A communication.*)  
—“Machines for mowing and reaping.”

The cutter bar is mounted so as to project at the side from the rear end of the frame in which the main running wheel is mounted. The draught pole is attached to the frame inside of this wheel, so that “the pole passes through the centre of effort.” There is an “auxiliary wheel” “upon an elastic” or spring axle at the opposite side of the wheel to the cutters. The driver's seat is across the whole breadth of the frame so that by moving from one side to the other he can depress the cutters or raise them from the ground. The cutters are so shaped as to “admit of the balancing of the cutter blades on an angular bar by the weight of the slide bar to which they are attached.” By this means the edge of each cutter “is kept in close contact with the shear edge” of the finger or guard.” The upper face of the cutter is roughened like a rasp, to assist in clearing out the cut grass. “The curve and general form of the fingers” “is such that their points bend lower than those of other machines” so that they “enter freely under lodged or fallen grass, instead of sliding over it.” The cutters are actuated by a cam driven by bevil gearing from the running wheel. This can be thrown into and out of gear.

When the machine is used for cutting grass “a small wheel furnished with ribs, and resting on a slightly slanting bearing, may be placed at the outer end and rear of the cutter beam. It touches the ground with its inner edge, and when revolving throws off the grass and forms a parting line between the cut and the standing grass.” Or instead of the wheel a “track board” with a handle thereon may be hinged in the same position.

When the machine is used for cutting corn, a reel and platform are added. The additional wheel also may be dispensed with, and a wheel mounted on the outer end of the cutter frame instead. Also the cutter frame may be moved to the front of the machine instead of being at the rear.

[Printed, 1861. Drawing.]



A. D. 1857, June 19.—No. 1718.

GARRETT, JOHN DUNNELL.—“An improved construction of  
“horse hoe.”

The invention relates to a mode of adjusting the mortice bar, to which the hoe levers are attached, and the raising or lowering of which bar regulates the angle at which the hoes are presented to the ground. The mortice bar is supported  
“at its opposite ends by pairs of pendent rods, which are  
“severally jointed to travelling nuts carried by a pair of  
“screw shafts mounted at opposite ends of the framing.  
“These shafts are each provided with right and left-handed  
“screw threads, and they are turned by means of winch  
“handles. Jointed to each end of the mortice bar is a guide  
“bar, which works in a guide or socket piece bolted to the  
“framing. These guide bars and sockets are intended to  
“guide the mortice bar in its upward and downward move-  
“ments. The rise and fall of the mortice bar (at either end)  
“is effected by turning the screw shafts, which will cause  
“the nuts of each pair of pendent rods to approach to or  
“recede from each other, and thereby increase or diminish  
“the space between the mortice bar and the framing of the  
“implement, according to the direction of rotation imparted  
“to the screw shafts.”

Another improvement consists in connecting the steering iron “to the mortice bar without any intermediate line or  
“other contrivance, which arrangement gives the attendant  
“increased command over the implement.” The patentee claims as his invention the mode of suspending the mortice bar of horse-hoes “by means of pendent rods or expanding  
“levers, which, as their angle of inclination is changed by  
“the rotation of screws or their equivalent, will raise or  
“lower the bar, and thereby adjust the hoes to the required  
“angle for entering the ground.”

[Printed, 10d. Drawing.]

A. D. 1857, June 25.—No. 1787.

PALMER, WILLIAM.—“Improvements in watering pots,  
“garden engines, and other apparatus for watering surfaces,”  
and distributing “liquid taken from manure pits, foul ponds,  
“or cesspools.” “The invention consists in making the rose

“ of a watering pot, garden engine, or other apparatus,” “ of  
 “ an oval form with a convex surface, and perforating the  
 “ same with fine holes and attaching it obliquely to a mouth  
 “ piece. The mouth piece is formed in one piece in the  
 “ shape of an oval truncated cone, the smaller end being  
 “ soldered to a screw collar to attach it to the spout or pipe”  
 of the apparatus used, “ and the larger end is soldered to the  
 “ rose.” One side of the mouth piece is flattened and made  
 longer than the other, so as to cause the rose to be tipped  
 forward to the required angle. “ A lengthening pipe is some-  
 “ times used with a screw collar soldered to each end, and  
 “ placed or screwed between the rose and the spout of the  
 “ watering pot or garden engine.” “ Another part of the  
 “ invention consists in making a percolator of a cylindrical  
 “ form, and perforating the same all over with small holes,  
 “ one end having a perforated bottom, and the other end a  
 “ ring soldered on to form a stop. The percolator when in  
 “ use is dropped bottom downwards into the spout or pipe”  
 of the apparatus employed, and is secured in its place by a  
 ring of the same “ fitting in between the two screw collars ;  
 “ one collar being soldered to the spout or pipe, and the other  
 “ to the mouth piece, or to the lengthening pipe.” “ Either  
 “ of the above inventions may be applied to hose or pipes  
 “ used in watering or irrigating gardens or lands.” The  
 patentee claims as his invention :—“ First, the use and form  
 “ of the oval rose,” as described ; and “ secondly, the use and  
 form of the percolator,” as described.

[Printed, &c. Drawing.]

A.D. 1857, June 27.—No. 1804.

POLLARD, JOSEPH.—(*Provisional protection only.*)—“ Im-  
 “ provements in machinery or apparatus for distributing  
 “ manure.” The manure is placed in a box or hopper, sup-  
 ported by a frame upon travelling wheels. At an opening  
 at the bottom of the hopper is placed “ a cylinder or roller,  
 “ by preference of bright metal,” and having “ a series of  
 “ ridges or projections along its surface,” whereby, as the  
 cylinder is caused to rotate, by being thrown into gear in  
 connection with one of the travelling wheels, the manure is  
 thrown out, and delivered to the ground through a spout or

shoot, in which are applied rods or grates to assist in scattering the manure, and at the top of which there is a sieve, "which can be worked by the machine itself or not, as may be preferred." The quantity of manure to be delivered is regulated by varying the speed at which the cylinder revolves, by means of change wheels, the regulation of the quantity being also aided by the adjustment of a brush, which is "formed of whalebone or other suitable material," and acts "against and along the surface of the cylinder." "A stirrer is placed inside the box to keep the composition or manure in motion. There are scrapers applied to act on the cylinder and keep it clean; these are borne against the cylinder, and so as to admit of their following the inequalities of its surface, by springs, weights, or other suitable means. Doors are applied to afford facility of access to the cylinder and other of the parts in case of need."

[Printed, 4d. No Drawings.]

A.D. 1857, July 7.—No. 1886.

SMITH, WILLIAM. — "Improvements in horse hoes and drills."

"The object of this invention is to render the hoes of horse hoes and the coulter of drills self-adjusting when the implement is working upon sloping ground or the hill side. To effect this, instead of connecting the bars which carry the hoes by means of rods to hooks on the adjustable shaft iron at the side of the machine," a central shaft iron is provided, to which is attached an adjustable fulcrum pin, whereon is mounted a sway bar, carrying at its opposite ends draught hooks to receive the hooked ends of rods, which connect cross bars carrying the hoes with the sway bar and thus, through the shaft iron, with the framing of the implement; "the like arrangement is applicable to horse hoes constructed with levers to carry the hoes instead of cross bars;" the same principle is also applicable to drill coulters, the sway bar being attached to a cross bar of the implement, by a central fulcrum pin, and carrying a rod which forms the fulcrum for a set of coulters levers.

[Printed, 1s. Drawings.]

A.D. 1857, July 7.—No. 1889.

**BURGESS, WILLIAM.**—"Reaping and mowing machines."

1. A "revolving divider" is fitted at the side of the machine to separate the standing crop from that which is cut, and to assist in carrying the latter on to the platform. This consists of a "cone or conical-shaped barrel, furnished or not with a "screw vane or screw vanes over the whole or any part of the "length thereof." "The apex or point of the cone or barrel "is placed towards the front of the machine, and in advance "of the knife or cutting apparatus." The cone is revolved by endless bands from the driving shaft.

2. "Divider boards," to be used when the above apparatus is not employed, are formed with a portion cut away, and replaced by a piece pivotted to the point of the board and secured in any position by a screw. This is meant to allow the vanes to pass closer to the fingers when short crops are being cut.

3. The vanes of the reel are made with additional sliding pieces on their ends, secured by set screws in any desired position.

The machine figured in the drawing is provided with "archimedian screws which form part of the platform." These are revolved by endless bands from the driving shaft.

[Printed, 10d. Drawing]

A.D. 1857, July 10.—No. 1923.

**GILL, JOHN.**—Reaping machines.

The machine is pushed forward by horses behind it harnessed to a pole. It is similar at each side, the cut crop being carried from the centre to each side and there delivered. In the centre of the frame is a large running wheel, acting as a driving wheel. In front there is a pair of small running wheels capable of being turned from side to side to steer the machine. The cutters are triangular blades, fixed to a reciprocating bar along the front of the machine, which is actuated from a crank driven from the large running wheel. The fingers are of two sorts, one broader than the other, and they are arranged to alternate, one large one and a pair of small ones. The cutters traverse from one large finger to the next. The cut crop is carried by a reel on to an endless travelling

apron working from the centre to the side. This deposits the drop on a platform formed of two rotating flaps worked by stops and a slide from the main wheel. The flaps when caused to rotate open in the centre, and deposit on the ground the corn that has collected on them. A shield, fixed in front of the main wheel, separates the corn in the centre, and causes it to fall towards one or the other of the endless bands. To balance the weight of the whole apparatus a weight runs to and fro on a curved bar of metal fixed under the draught pole.

[Printed, 10d. Drawing.]

A.D. 1857, July 10.—No. 1925.

MOON, JAMES, BELT, ROBERT, and EWBANK, GEORGE.—*(Provisional protection only.)*—"An improved agricultural implement." The invention, which relates to "the construction of a double action spiked land roller or clod crusher," "consists of two cylinders or rollers mounted horizontally upon metallic frame-end bearings, and furnished with projecting spikes or teeth upon their peripheries, so as to break or crush the ground by their revolving action when in use, the said spikes moving between and in advance of each other upon the said rollers, whilst travelling wheels secured to the framework are employed for raising or lowering the apparatus, either for the purpose of being removed or brought into action, an arrangement for regulating the height of the apparatus suitable to the draught of different sized horses being also affixed to the frame."

[Printed, 4d. No Drawings.]

A.D. 1857, July 10.—No. 1926.

SMITH, WILLIAM.—"Steam engines for giving motion to agricultural implements."

No improvement in the engine itself is described. The invention "consists in arranging the back of the engine so that the implement attached thereto may be guided or moved sideways in either direction, and also so that the implement may be raised out of the earth by means of a crane attached to the back of the engine." For this purpose the implement is "attached by a hinge joint to a slide which slides between guides at the back of the engine."

Motion is given to this slide preferably by a screw actuated by a winch handle and bevel gearing. To raise the implement from the ground a chain is attached to the end thereof, and "the implement being connected to the slide at the back of the engine, by a hinge joint, when the crane is turned the back of the implement is raised."

[Printed, 10d. Drawing.]

A.D. 1857, July 14.—No. 1951.

URRY, 'BARNABUS.—(*Provisional protection only.*)—"Improvements in seed drills." "These improvements have reference, firstly, to an arrangement for changing the speed of the seed-box gearing." The seed box is supported by bearings on two side or drill bars, which are supported at their foremost ends at any required elevation by adjustable screws, while their hinder ends rest upon grooved rollers on the upper ends of lifters or cranked arms, one at each end of a longitudinal iron spindle. These lifters stand "respectively at an angle of about 130 degrees with each other," so that, when the spindle is moved by means of a lever "one side bar will be raised, and the opposite one lowered at the same time," and "the wheelwork of the seed box will be lifted out of gearing with one of the driving wheels, and thrown into gear with that on the other side," and the rate of speed thereby altered, owing to the employment of a different sized toothed wheel on each side. "When the seed box is mounted within a manure box the speed of the apparatus may be changed by giving a backward or forward motion to the ordinary quadrant wheels, by an adjustable connecting rod acted upon by a spindle at one end, with angularly placed cranks on the other."

Secondly, "to a mode of throwing the whole of the working apparatus out of action" by one simple movement. The drill bars are lifted as before by two lifters, which in this case are affixed to the ends of a hollow iron tube, placed upon the first-named spindle, and actuated by a lever. Around the said hollow tube is placed a roller, from which are suspended chains to carry the coulters, and at one end of which is a toothed wheel, actuated by means of a winch handle and a pinion, fixed on a parallel spindle; this pinion "also gives motion to a second toothed wheel, which carries a small



" fusee for winding up a chain which is fastened to the end of  
 " the lever of the hollow iron tube." The length of the several  
 chains being properly adjusted it follows that on turning  
 the winch handle the machinery of the seed box will be  
 lifted out of gear, and the coulters will be raised at the same  
 time.

[Printed, 4d. No Drawings.]

A.D. 1857, July 14.—No. 1952.

WYATT, WILLIAM.—(*Provisional protection only.*)—"Hay-  
 making machines."

The following is the whole Provisional Specification :—

" My said improvements consist mainly in a novel mode of  
 " adjusting the distance of the forks from the ground, in  
 " placing the fork barrels farther behind the driving wheels  
 " than customary, in providing a loose sliding grooved pinion  
 " or pinions for reversing the motion of the fork barrel, and  
 " in having the tips or ends of the forks in the form of a  
 " single tine flattened out. The framing to which the  
 " driving wheels is attached carries the fork barrels beyond  
 " the driving wheels, and this frame has in front a perforated  
 " adjusting sword or brace set vertically, and the frame has  
 " also an extra shaft frame moving on pivots at the sides, and  
 " has a key or screw opposite the sword working into the per-  
 " forations for raising or depressing the main frame as may  
 " be required, and securing it thereto. The shafts are  
 " attached to this extra frame by brackets with bolts. The  
 " fork barrel has at each end grooved pinions, which slides in  
 " or out of gear for reversing the motion ; and the forks have  
 " their tips or ends flattened in the form of a single tine,  
 " enabling them to perform the functions of the fork, whether  
 " moved forwards or backwards."

[Printed, 4d. No Drawings.]

A.D. 1857, July 14.—No. 1956.

CLARE, WILLIAM STETTINUS.—(*A communication from  
 Alexander Hamilton Caryl.*)—"Machines for harvesting  
 " grain and grass crops."

1. A mking apparatus is described. The object of this is  
 to enable the apparatus to be brought into action by the driver  
 whenever a sufficient amount of corn has been collected on the

platform to form a sheaf. The rake is suspended by a vertical sliding bar from a box at the end of a horizontal bar mounted so as to swing in a horizontal plane on a short vertical shaft. This vertical shaft has on it a toothed quadrant gearing with a segmental rack on the rim of a box wheel running loose on the driving shaft. Attached to this wheel is a coiled spring, the end of which is fixed to a pin passing through a slot in one face of the wheel. A ratchet wheel fast on the driving shaft fits close against this wheel and gives it a partial rotation by one of its teeth catching a pin on a short arm pivoted to the box wheel, thus turning the short spindle, and carrying the arm and rake through a quarter of a circle and across the platform; as soon as the partial rotation has been accomplished, the pin strikes against a stop, and is taken out of the ratchet tooth, a catch at the same time taking a stop on the wheel so as to hold it fast with its spring coiled, while the ratchet is able to run without imparting movement to the box wheel. The stop and catch are both worked by a lever, the end of which is close to the driver's foot, so that by depressing it, the wheel is set free and the reaction of the spring carries back the rake. This is done whenever sufficient for a sheaf has collected, or, if it be desired to lay the corn in a swathe, the lever is kept permanently depressed, and the rake then reciprocates rapidly backwards and forwards.

This to-and-fro movement of the rake is accompanied by an up-and-down motion thereof, which raises it and depresses it, to seize the crop and swing back clear of it. Parallel with the supporting horizontal bar is a shaft with two pinions thereon. One of these engages with a rack on the sliding handle of the rake so as to raise the rake as it revolves. The other runs free on the shaft, but a pin thereon engages with a ratchet wheel fixed on the shaft. Motion is given to this loose pinion by a short fixed segmental rack on which it runs, when the rake is just at the end of its traverse. It thus raises the rake, which is held raised by a catch on the ratchet until the rake is swung back, when the catch strikes a stop, the shaft is free to revolve, and the rake is thereby lowered. To lessen the shock of the rake's swinging back it is received by an india-rubber cushion on a standard. To regulate the action of the rake, the supporting bar may be turned in its socket, so as to alter the angle at which the rake acts. The above description

can scarcely fail to be unintelligible without the assistance of drawings, but without their help it appears difficult to give a clear idea of the somewhat complicated mechanism employed.

2. The draught pole is connected to the machines by links, attached below and behind the axle. The "rear end of the" "hounds are forked" and "pass over a pin" on the frame. The object of this is that in backing the machine the force applied may not tend to prevent the cutters being raised. The driver's seat is placed well at the back so that his weight may counterbalance that of the front of the machine.

3. The finger bar is bolted to the bottom of the "divider" in order to prevent clogging.

[Printed, 1s. 8d. Drawings.]

A.D. 1857, July 15.—No. 1970.

BLANDFORD, HENRY. — "An improved combination of "apparatus for distributing manure." A solid manure distributor, mounted on two parallel wheels of a smaller diameter than usual, and supported in front by a swivel guiding wheel, "is attached by means of chains, or by short wrought iron "shafts," to the tail or axle of an ordinary farm cart or waggon, so that "the distributor will be situated behind and "immediately below the tail of the cart or waggon," "thereby "allowing the manure to be pulled or shovelled from the "cart or waggon into the trough" "of the distributor as fast "as it is required to be distributed." For the purpose of spreading the manure, "a revolving agitator," actuated through gear by one of the running wheels, and "carrying a "number of prongs or forks, may be fitted to work inside the "trough, and pass between the spaces of a horizontal set of "spikes," forming the bottom of the trough. The inventor does not confine himself to the precise details or arrangements described, but he claims as his invention :—

"First, the general combination of a solid manure distributor with a cart or waggon, as herein-before described."

"Second, the peculiar combination of apparatus for spreading ordinary farm-yard manure," "rough or prepared compost, ashes, or any description of manure in a solid form," "as herein-before described."

"Third, the attaching of any suitable solid manure distributor, in combination or not with seed or corn drilling apparatus,

“ to an ordinary or other cart or waggon in such a manner  
“ that it shall be placed behind and immediately below the  
“ tail of such cart or waggon, for the purpose herein-before  
“ described.”

[Printed, ed. Drawing.]

A.D. 1857, July 18.—No. 1989.

LACY, AUGUSTUS DACKS, and HOMERSHAM, WILLIAM COLLETT. — “Improvements in machinery for ploughing, and  
“ cultivating land by steam or other suitable motive power.”  
The invention consists, firstly, “in the transmission of the  
power from a steam engine, or other prime mover, to the  
“ rope or chain employed to work the plough or implement  
“ over the land, by means of a capstan or windlass, around  
“ which only a few turns or coils of the rope or chain are  
“ taken as distinguished from a drum on which the rope or  
“ chain is wound; also such rope or chain not being endless,  
“ but having a slack or tail to be either coiled by hand or  
“ taken up on suitably mounted and driven drums.” The  
capstan is represented as slightly tapering, and it gives motion,  
by means of gearing, to an apparatus for delivering the slack  
of the rope, such apparatus consisting of “an independent  
“ conical drum,” having spring rollers to press the rope  
against it; the capstan, however “may be modified, as to the  
“ form, arrangement, and number employed, and the motive  
“ power may be varied;” but the inventors “prefer to use  
“ two steam engines having a link motion to work the slide  
“ valves fixed on the same frame as the capstan or windlass.”  
A revolving brush or other convenient arrangement may be  
employed for taking the mud off the rope before it passes on  
to the machinery.

Secondly, in mounting coiling drums, one of which is  
“ caused to revolve to take in the slack of the rope from the  
“ delivering apparatus by means of the rope in tension between  
“ the plough or other implement” “in frames adapted to  
“ facilitate their transport, the frames consisting of cart  
“ wheels of the ordinary construction provided with suitable  
“ apparatus for rendering them stable or firm when the coiling  
“ drums are brought into operation.”

Thirdly, “in the adaptation and application of screw piles  
“ as means of anchoring or fixing and giving the required  
“ stability to the portable winding apparatus and engine when

" they are employed," and " to the pulleys or mechanism required for the working and guidance of the actuating rope or chain," and also to " other apparatus used in the cultivation of land." A screw pile may be employed merely as an ordinary mode of anchoring or holding applied to a guide pulley " for guiding the rope in tension between the capstan and the plough or other instrument;" or the screw pile may be " adapted to be used so as to remain vertical under a horizontal strain by its being combined with horizontal boards or guards;" or a screw pile may be " used in combination with the usual tension chains or ropes, and be passed through a boss in the centre of the guide pulley, and screwed to the required depth in the ground, the frame of the pulley being mounted on a temporary tramway; the inventors do not confine themselves to this mode of fixing the mounted guide pulley, as it may be fixed by screw piles applied to its frame.

[Printed, 2s. 4d. Drawings.]

A.D. 1857, July 18. — No. 1200.

AUSTIN, JAMES. — (*Provisional protection only.*) — " Improvements in machinery or apparatus for ploughing or cultivating land." The machinery consists of a triangular open frame, supported upon wheels, and having at its forward end an upright steam engine and boiler, the overhead crank of which engine actuates, by means " of toothed and belt or chain gearing," a main forward ground wheel, furnished with ribs or projections on its periphery: " the belt connection between the engine and this wheel is contrived so that the movements shall always work in proper gear independently of the working of the frame upon its supporting wheels." This wheel is also the steerer, " being connected by means of gearing with a hand or steering wheel at the back of the frame. " The extreme back of the framing consists of a pair of ploughing guides, extending out transversely as regards the path of the machine to a distance sufficient to cover the extent of ground to be ploughed at once in the lengths of the furrows which run across the field's breadth. This portion of the framing carries a set of four large wheels or chain pulleys, over which are passed two distinct endless chains or ploughing belts. The two contiguous chain pulleys near the centre of the machine are actuated in

“ reverse directions from the same engine which drives the  
 “ front ground or travelling wheel, so that the forward  
 “ traverse of the machine at right angles to the lines of fur-  
 “ rows bears a determined relation to the rate of the ploughing  
 “ chains at right angles with this forward traverse. Each  
 “ chain or ploughing belt is fitted with suitable ploughs or  
 “ cultivators, which, as the machine works continually, enter  
 “ the ground to plough it up in their bottom traverse, and  
 “ emerge from the ground to return free in their upper back  
 “ traverse. Each plough is kept steady in its action by a  
 “ suitable wing piece, fitting guides in the framing. The cross  
 “ ploughing frames are not set in an accurate right angle  
 “ with the forward framing, but slightly off that line, to such  
 “ an extent as will just allow for the forward traverse of the  
 “ whole machine, and result in the formation of accurate  
 “ transverse furrows across the field.” “ This plough always  
 “ works with its ground wheel or wheels upon the unploughed  
 “ ground as it moves constantly forward, leaving the ploughed  
 “ ground behind it. When it is to be conveyed from field to  
 “ field, the two ploughing frames are folded back, so as to  
 “ form in the whole one long running frame easily portable.”

[Printed, &c. No Drawings.]

A. D. 1857, July 20. —No. 1999.

SMITH, HUGH.—(*Provisional protection only.*)—“ An im-  
 “ proved agricultural implement for pulverizing and cleansing  
 “ land.”

Across the implement are placed “ one or more shares in the  
 “ shape of knives, and behind, or rather continuing upwards  
 “ from the back of the knives, is an endless apron or belt,”  
 which travels over a back roller, “ placed slightly in advance  
 “ of two or more reducing or pulverizing rolls or other suit-  
 “ able reducing agents, from which the pulverized soil falls.”  
 “ Upon the onward motion of the implement, the share or  
 “ shares enter the earth ” to a depth regulated by a guide  
 wheel in front of the implement, “ take up the soil and deliver  
 “ it on to the endless apron, from which it falls after passing  
 “ through the pulverizing rolls. In addition to crushing rolls,  
 “ teeth may be employed for the purpose of freeing the soil  
 “ raised from twitch and other grasses and weeds.”

[Printed, &c. No Drawings.]



A. D. 1857, July 20.—No. 2003.

NEWTON, WILLIAM EDWARD. — (*A communication.*) —  
"Reaping and mowing machines."

The cutters are driven from both running wheels, which have on them spur wheels engaging with pinions mounted each with a ratchet and pall so that either wheel can run round without actuating the cutters, or the machine can be driven backward in the same way. The pinions above mentioned are on a cross shaft on which is also a bevel pinion engaging with one on an inclined shaft passing down to a point near the ground at the back. A crank on this shaft by means of a connecting rod actuates the cutter bar, which is mounted in a frame of the usual character at right angles to the body of the machine. This frame is attached to an arm which extends along the side of the machine and is jointed to the front thereof, so that the cutter bar, &c. can rise and fall with inequalities in the ground.

[Printed, *sd.* Drawing.]

A. D. 1857, July 20.—No. 2005.

COWHAM, HENRY VENNOR. — "Machinery for breaking or  
"pulverising land."

A transverse shaft set in a suitable frame has set loosely on it a number of bosses with radial spikes. Between every two of these is a fixed tine on a boss with a radial arm at right angles to the tine, and to the end of this arm is attached a rod connected to a lever by which the tine can be raised. The shaft has on it the running wheels of the machine. For moving the apparatus from place to place larger wheels may be fitted on the axle, or they "may be mounted on stud axes, "which studs slide in slots in the slide frame." The fixed teeth may also be carried by a separate transverse bar, and they may be forked so as to fit over the shaft, or they may pass on either side thereof and rest against steady bars below.

[Printed, *sd.* Drawing.]

A. D. 1857, July 22.—No. 2017.

KIRBY, JOSEPH. — "Hay and other rakes."

The invention consists in mounting a receptacle behind a horse or other rake and arranging apparatus to deliver the hay

into the receptacle, which is tilted when full. The tines are mounted in the usual manner in a wheeled frame, and have a lever as usual by which they can be raised and disengaged from the hay when a sufficient quantity has been collected. Behind these tines there is a second set on a shaft capable of rotation. By an arrangement of levers, actuated from a slotted arm connected to the main lever above mentioned, this shaft is rotated as the first set of tines is raised. The hay is thus received by the second set, and thrown by them into the receptacle behind. A handle is arranged for tilting this when full.

[Printed, 10d. Drawing.]

A.D. 1857, July 31.—No. 2080.

EVANS, EDWARD and ROSKELL, GEORGE POTTS.—(*Provisional protection only.*)—"Reaping and mowing machines."

The following is the whole Provisional Specification:—

"We employ a series of knives or cutters working in a horizontal direction upon a vertical shaft, to which motion is given by bevil wheels driven from the power obtained by the driving wheels of the machines. The knives or cutters rest upon feeders or cutting plates forming a surface for the knives to cut on; they are placed so as to form a portion of a circle of the same radius as the outer diameter of the knives. On the vertical shaft rods are placed at intervals, which turn with it for the purpose of collecting the corn or grass, and the rods turn in a contrary direction, being placed upon another vertical shaft, and pass between them for the purpose of laying the corn or hay on the side of the machine. If the corn should be laid or beaten down we place or attach to the end of each feeder or cutting plate a gatherer, made of bent wire, which rests loosely on the ground, with a turned up point to prevent it catching the clods, thereby raising the corn into the feeders or cutting plates. The bed with the cutting plates and knives can be lowered or raised to any given height, and the machine can be guided in any required direction by guide wheels which are under the control of the driver. The machine being pushed forward or propelled by horses being geared to a pole with their heads towards the machine."

[Printed 4d. No Drawings.]

A.D. 1857, August 1.—No. 2093.

COLEMAN, RICHARD. — (*Provisional protection only.*)—  
 "Improvements in implements for ploughing, hoeing, and  
 "scarifying land, and in agricultural steam engines used for  
 "the traction of such implements."

The invention is a further improvement upon a previous Patent, No. 10,685 (old law) and relates, firstly, to apparatus for raising and lowering the working instruments of the above-mentioned implements, and is particularly applicable to those parts of an implement detailed in the Specification of a former Patent, wherein the said instruments are raised by a single hand lever. In this invention, a hand lever is placed on a fulcrum near the fore part of the machine, and is connected by a link or rod with an arm or lever fixed on a barrel with which the working instruments are connected; the said hand lever is connected by a suitable link or chain to a second hand lever, which acts upon the first-named hand lever when additional leverage is required.

The invention relates, secondly, to improvements in agricultural steam engines.

[Printed, 4d. No Drawing.]

A.D. 1857, August 1.—No. 2094.

AROUX, GUILLAUME FÉLIX. — "Seed drills."

The invention "consists, first, in the application to ordinary  
 "seed drills of as many hand wheels or rollers as there are  
 "discharge pipes for depositing the seed, so that each wheel  
 "may correspond exactly with each drill sown."

"Secondly, in the construction of an improved seed drill,"  
 wherein the seed, which is contained in a chamber with adjustable slides, falls upon seed distributors, consisting of grooved rollers, or rollers with cups round them, and fixed on an axis, such cups having stems divided into two parts forming springs, which serve to fix the cups to the rollers; the revolution of the axis of the seed distributors causes the seed to be delivered to the ground through coulters. The chief improvements in this drill consist, 1st, in "the employment of two small steering wheels for placing the coulters in a square position," such wheels turning freely on joints, and being attached to the machine by pins passing through perforated bars, whereby

the wheels can be adjusted vertically, and the front of the drill thereby raised or lowered in order to give the necessary degree of inclination to the coulters, and the wheels can be lifted off the ground when required ; 2nd, in a mode of communicating motion to the axle of the seed distributors from the axle of the above-named "hind wheels or rollers," by means of toothed wheels and a chain and pinion connecting the said axle with a pinion turning freely on the axle of the seed distributor, which latter axle carries a second pinion, which can be thrown in or out of gear with the first pinion by means of a rod, whereby the seed distributors can be caused to work or not, as required ; 3rd, in "the construction and employment of" "hollow" "coulters formed with a double jaw, for sowing two rows or" "drills at the same time ;" 4th, in "the employment of a" "conductor's seat, serving to contain weights which may be" "adjusted at will, so as to press more or less on the hind" "wheels ;" 5th, in "the construction and employment of" "tracers, for forming furrows or guides for the return of the" "drill ;" 6th, in "the application to all kinds of drills of" "three or a larger number of hind wheels or rollers and" "coulters ;" 7th, in a mode of fixing and arranging the shafts so that they can be raised or lowered, "either by hinges or by" "an iron pin passing through the framing, and holding at" "each end the two shafts, so as to permit that, on pressing to" "the right or to the left, the drill may be turned round with" "facility."

[Printed, &c. Drawing.].

A.D. 1857, August 1.—No. 2097.

**RICKETT, THOMAS.**—"Implements for cultivating land."

In this improved implement, which may "be moved by a" "locomotive engine or other power," several cutters or tines, similar to each other in form, are set one after the other round a shaft, which in action "is carried over or through the land," "at right angles or transverse to its axis." This cultivator shaft revolves in the bearings of two radial links, having a countersunk shaft, which may be driven by a chain or other means from the engine shaft, or worked directly by the travelling wheels, for their centre. The cultivator shaft can be raised or lowered as required by means of screws, and has revolving motion communicated to it by means of "notched pulleys or

"chain wheels," from the countershaft, whereby it is caused to rotate in the reverse direction to that of the travelling wheels. "The cutters or tines are each made a few inches wide, and it is preferred that each boss on the axis or shaft should only have two tines formed thereon, and that such two tines should come at opposite sides of the axis or shaft." The cutters or tines are made of a curved form, and "the cutting or outer end of each tine in its revolution enters the land at a point considerably behind its axis of motion, and as the axis is moved forward and is caused to revolve, the end or cutting edge of each tine rises out of the surface of the land considerably in advance of the axis of motion. The tine raises up the portion of land removed by it, and such cut portion is then carried over the axis or shaft."

[Printed, 8d. Drawing.]

A.D. 1857, August 4.—No. 2113.

CAMBRIDGE, WILLIAM COLBORNE.—"Press wheel rollers or clod crushers."

The chief object of this invention, the patentee says, "is to improve the construction of the self-clearing wheel rollers and clod crushers." "The ordinary crushing wheels, which go to form the compound rollers, I separate by inserting between them narrow wheels, which may have either a plain or serrated periphery. These narrow wheels I prefer to make about half an inch less in diameter than the other wheels; and I make the bore for the axle about half an inch larger than the adjacent wheels, so as to allow for play, and enable them to keep in contact with the ground. The friction of the adjacent wheels against the sides of these narrow wheels will have a tendency, together with their own weight, to keep them down, and ensure their efficient action on the clods which they may meet; and this rubbing action, coupled with the unequal speed of rotation of the adjacent wheels, will ensure the self-clearing of the roller from clods and other matters while it is in use." The inventor does not confine himself to "any special proportions either for the relative diameter or breadth of the intervening rollers," but what he claims as his invention is the "combining plain and serrated press wheels together on a common axle, in the manner and for the purpose above described."

[Printed, 12d. Drawing.]

A.D. 1857, August 12.—No. 2151.

WAGSTAFF, ROBERT.—“Machinery or apparatus for digging  
“ land.”

A carriage propelled by a steam engine has mounted thereon in a suitable frame a number of steam cylinders. To the piston of each cylinder a spade is connected. The spades and the corresponding cylinders are arranged in two sets, one set cuts in a direction parallel with the line of movement of the machine, to cut the sides of the spadefulls of earth, the other set is placed with the blades at right angles to the former to lift and turn over the soil. The first set has simply a reciprocating motion, entering and leaving the ground. The stems of the second set are jointed, and are also jointed at the middle of their lengths to jointed rods connected at their other ends to the frame above. The spades are driven vertically into the ground as far as the jointed rods allow, when, the pressure still continuing, the ends of the spade handles are depressed and the blades raised, the whole spade thus becoming a lever of which the end of the rod is the fulcrum. As it is raised it is turned a quarter circle on its axis by a pinion on its stem running on a toothed quadrant. A rack is fitted to raise all the spades from the ground.

Some improvements in the engine are also described.

[Printed 10d. Drawing.]

A.D. 1857, August 18.—No. 2194.

KEDDY, THOMAS.—“Machinery for the cultivation of land.”

The improved machinery, which may be worked by horse, steam, or other power, although the inventor prefers steam power, consists essentially of three parts. “The anterior part consists of guiding machinery for the purpose of directing the motion of the whole machine. The said guiding machinery consists of a roll or rolls capable of being turned in any desired direction, and is made to take a firm bearing on the land, either by being depressed or by the raising of the middle portion of the machinery.” The bearings of the said guide roll turn upon a vertical shaft, which is connected, by means of gear, to a handle, whereby the guide roll may be turned in any direction; the raising or depressing of the guide roll is effected by means of a piston on the top of the vertical shaft, and working in a cylinder, which is supplied with steam from a boiler.



"The second or middle portion of the machine consists of  
 "a carriage carrying the steam engine and boiler by which  
 "the machinery is actuated." The said carriage moves on  
 two heavy rollers, which by preference are not cylinders, but  
 prisms of ten, twelve, or other number of sides. "The said  
 "rollers are geared together and a jointed endless band of  
 "metal works over them. A series of small cylindrical rollers  
 "within the endless band cause the lower portion to bear in  
 "its whole length on the land, and the upper part of the band  
 "is supported by other small rollers." The machinery is  
 moved upon the land to be cultivated by gearing the rollers to  
 the steam engine by cranks or otherwise.

The third or posterior part of the machine consists of two  
 portions, first, a series of screws or blades, placed vertically  
 and in a line at right angles to the line of draught. "These  
 "screws are put into motion by being geared to the last-  
 "described part of the machine, and the distance to which  
 "they penetrate the ground is returned by guide rollers,  
 "which can be set to any desired depth," or the precise depth  
 to which the screws enter the ground may be regulated by the  
 action of screws. The second portion of this part of the  
 machine "consists of a series of vertical prongs somewhat  
 "resembling a harrow; these prongs are fixed in a moveable  
 "frame," which has an oscillating or zig-zag motion given to  
 it, and "beneath which is a fixed plate, having holes through  
 "which the prongs pass. The use of the said plate is to  
 "clean the prongs, for when the frame carrying them is raised  
 "the prongs are drawn through the holes in the plate, and  
 "thereby scraped clean." Mechanism is described whereby  
 the weight of the carriage can be taken off the rollers, and  
 thrown upon wheels, when it is required to move the machine  
 from place to place. "A drilling or sowing machine follows  
 "the harrow." The machine may, when required, be em-  
 ployed as a stationary agricultural steam engine for thrashing  
 or other purposes.

[Printed, with Drawings.]

A. D. 1857, August 19.—No. 2201.

DUNDONALD, THOMAS, Earl of.—(*Provisional protection  
 not allowed.*)—"Preparing land for agricultural purposes."

"The invention relates to an improved method of preparing  
 "land for agricultural purposes," by means of an instrument

consisting of "cutters, blades, or prongs of metal, attached to  
" the periphery of a revolving cylinder or suitable axis, which  
" receives its motion from the axis of the bearing or driving  
" wheels, to which it is united by means of a suitable frame.  
" These cutters, blades, or prongs extend across the surface  
" or space to be operated on, and may be placed diagonally or  
" otherwise, being connected with the frame by side stays,  
" which act as coulters in dividing the soil longitudinally.  
" The velocity of the cutters, blades, or prongs (which have a  
" rotary motion), should be greater than that of the circum-  
" ference or periphery of the bearing or driving wheels (which  
" are fitted with projections to prevent slipping, so as to  
" ensure the displacement and mixing of the subsoil with that  
" above it, which, being together thrown on to the surface  
" transversely to the line of motion is formed into alternate  
" ridges and furrows, the ends or extremities of which termi-  
" nating in and communicating with the longitudinal furrows  
" at the sides, previously or simultaneously made, insures a  
" more uniform and freer discharge of the drainage water.  
" Where desirable for facilitating the deposit of the seed,  
" longitudinal furrows may be formed on the surface by an  
" indented roller following in the rear of the instrument  
" before described, and attached to the same frame or not, as  
" found most convenient."

[Printed, 4d. No Drawings.]

A.D. 1857, August 22.—No. 2233.

LEVISON, LUDVIG.—(*A communication.*)—"Mechanical  
" purchases to be employed for hoisting purposes, and for  
" extracting roots and stumps of trees."

A long lever is mounted with a wheel at each end by which it is supported off the ground. On one side near one end of the lever there is a short chain attached, the end of which is secured to a fixed point, such as a stump of a tree. This chain forms the fulcrum. On the other side two chains are attached, at points having the point of attachment of the first chain between them. Both these chains are hooked to a single chain led to the top of a shear-legs and thence to the stump to be extracted, to which the chain is secured. By moving the end of the lever furthest from the chains in one direction, one chain is tightened and the other slackened off; the slack chain is

then hooked a further distance up the chain on the stump, the lever is moved in the opposite direction, the other chain slackened and in its turn attached nearer the stump, and so on. The lever is moved by a horse harnessed to the end.

[Printed, 6d. Drawing.]

A. D. 1857, August 24.—No. 2238.

RICKETT, THOMAS.—(*Provisional protection only.*)—"Machinery for sowing seeds and manure."

"For these purposes a carriage is constructed to run on wheels or on sledges. At the fore part of the carriage is formed a fixed incline or platform, at the lower front edge of which there is a sharp or thin edge, which divides the soil in a horizontal line below the surface of the land, and at a greater or less depth as may be required. This incline or platform has at each side a raised edge of somewhat greater depth than the forward edge is intended to work below the surface of the land. Above the inclined platform there are endless chains, working on suitable wheels or rollers, and such endless chains at intervals have blades or paddles affixed thereto, which move the earth up the incline or platform and cause it to pass beyond the upper end thereof, where there is a descending incline or platform, down which the raised earth descends on to a screen, the clods or lumps being broken or crushed by a suitable roller or apparatus as they descend to the screen, which is intended to separate roots and other matters from the earth, and such roots and matters are received into a suitable box or receiver at the back end of the machine. Below the inclines or platforms are arranged drills or apparatus for depositing seed and manure on the surface of the land from which the upper soil has been removed, and on to which it again descends as it passes through the screen."

[Printed, 4d. No Drawings.]

A. D. 1857, September 1.—No. 2291.

BELL, GEORGE.—"Reaping and mowing machines."

The machine is propelled by horses harnessed to a pole behind, pushing it forward. It is supported on a pair of large wheels which act as driving wheels and communicate reciprocating

cating motion to the cutter bar by means of a rocking lever affixed to the back thereof and actuated by a crank and bevel gearing from the running wheels. There is also a small pair of wheels under the front of the machine. The cutter is a serrated bar acting through slots in a series of fingers. Below the draught pole is a "steering pole" or lever by which the front of the machine can be raised. The gatherer is carried on the end of an arm that can be raised and lowered by a cord or chain which is led back to the end of the draught pole.

[Printed, 8d. Drawing.]

A.D. 1857, September 1.—No. 2298.

**SACK, RUDOLPH.**—"Construction of ploughs."

"According to this invention, two sets or pairs of coulters  
"and turnfurrows are used, placed one set in front of the  
"other, and both cutting in the same line but at different  
"depths. In the hinder coulters and turnfurrow, the turn-  
"furrow is made in one piece, but with two planes or surfaces;  
"the front portion has a nearly horizontal transverse section,  
"but is inclined upwards and sideways towards the back and  
"right side gradually, somewhat after the form of a horizontal  
"wedge, and serves to raise up the undersoil to the surface,  
"whilst the back portion or surface of the turnfurrow is bent  
"over into such a vertical angle as to turn over the lower or  
"under soil upon the soil turned over by the front coulters  
"and turnfurrows." Another part of the invention consists  
in "the application and use of adjustable antifriction wheels  
"or rollers projecting slightly beyond the land side and sole  
"of a plough, for the purpose of easing the draught and  
"facilitating the transport of the plough." "The beam of  
"the plough is attached by a universal swivel joint to a  
"vertical sliding frame carried inside another frame on an  
"axle in front of the plough, which axle carries a pair of large  
"running wheels. The depth of the furrow is adjusted by  
"means of a screw spindle in connection with the inner or  
"sliding frame above referred to. A short chain connects the  
"top of the fixed vertical frame to the beam, so as to keep  
"the frame in a vertical position, whilst a double chain con-  
"nects the beam with a bolt or pin in the lower end of the  
"inner frame. One of the large running wheels which runs

" upon the surface of the unploughed land is made adjustable  
 " in height." " For this purpose the axle is made in two  
 " parts, and each part is bent up vertically to a right angle,  
 " the two vertical portions of the axle being coupled together  
 " by suitable collars or rings secured and tightened by set  
 " screws."

[Printed, 10d. Drawing.]

A.D. 1857, September 12.—No. 2372.

FISHER, NICHOLAS.—" Machinery combining operations in  
 " preparing land for agricultural purposes."

A circular frame mounted to revolve on a vertical axis is carried by a pair of wheels. The revolving frame works within a fixed one round the rim of which is a circular rack. Shafts fitted radially in the revolving frame have pinions on their ends which engage with the fixed rack and thereby revolve the shafts. On these shafts tilling implements of different sorts are mounted, such as " grubbers," " revolving tines," " scuffle tines," harrows, rollers, hammers, &c. It appears that several of these machines are to be connected by cross beams carrying coulters and prongs, but only one separate apparatus is shown in the drawing. The machine is to be driven by steam power applied through ropes, &c.

For cleaner land a different machine is to be used. Smaller horizontal wheels carrying " grubbers, harrows, scarifiers," &c. are set round a large wheel and driven by cogs thereon engaging with cogs on the small wheels.

[Printed, 6d. Drawing.]

A.D. 1857, September 17.—No. 2409.

HAYES, EDWARD.—" Winding apparatus for hauling ploughs  
 " and other agricultural implements."

Across a rectangular iron frame, mounted upon road wheels, is fixed a hollow or solid iron shaft, upon which are loosely mounted two winding drums—one on each side—to receive the coils of the wire or other hauling rope, and which wind and unwind alternately as they respectively receive motion. Upon the same shaft, and by the side respectively of each drum, is fitted a bracket or carriage, which does not rotate, but carries a counter shaft or spindle, with spur, bevil, screw, or other

gearing, for the purpose of driving the respective drums. On the centre of the same shaft are placed three pulleys, driven by a strap from a steam engine. The two outer pulleys have each a wheel attached to its boss, for the purpose of giving motion respectively to the drums; the centre pulley is a loose pulley to receive the strap when neither drum is in motion or work. Across the frame of the windlass, and parallel to the iron shaft, is an iron bar, capable of sliding laterally, and carrying an eye or guide for the strap; a locking bolt secures the bar so that the strap may be run on either pulley. By means of a trigger and string the locking bolt may be withdrawn by a person from a distance. "When the locking bolt " is removed, the fork bar is, by means of springs or weights, " caused to traverse a distance so as to shift the belt on to the " loose pulley, and the same movement of the fork bar allows " the same or other springs or weights to bring breaks to act " on the winding drums; but when the fork bar is moved by " a hand lever, so as to throw one of the driving pulleys again " into gear, the same motion of the bar removes the break " from the drum to which that driving pulley gives motion." In order to distribute the rope evenly on the winding drums, it is caused "to pass through guides to which a to-and-fro " motion is given, by means of a pinion mounted on a shaft, " which is driven by a screw on the boss of a winding drum. " The guide is attached to a bar on which are a series of pegs " or teeth, and the pinion works alternately on the upper and " under sides of these teeth, as in a mangle motion."

[Printed, *iz.* Drawings.]

A.D. 1857, October 5.—No. 2553.

HARVEY, JOHN PENFORD.—(*Provisional protection only.*)  
—"Machinery for crushing land or clods."

The invention consists in mounting loosely and independently on one common shaft "two, three, or more sets of discs (with " corrugated or indented edges)." The individual discs of each set "are all connected together by loose clutches, which " will however admit of their having a separate motion of " about half an inch or so on the shaft, for the sake of enabling " them to clear away clods or earth that may stick in the inter- " stices between the discs." "The discs are arranged in such " a manner on the shaft, that the projections of each are



"opposite to or in front of the indentations of the adjoining ones." "The shafts of the implement are also bent and adapted to the roller in such a manner that the line of draught may be from the axle of the roller to the horse's shoulder instead of being allowed to press on his chest."

[Printed, &c. No Drawings.]

A. D. 1857, October 6.—No. 2568.

ROMAINE, ROBERT.—"Machinery for digging or cultivating land."

Improvements on former patented inventions.

1. The digging apparatus formerly invented by the patentee is mounted upon a "novel arrangement of portable way which forms a kind of endless platform for each of the wheels to run on." "Pendent from the engine boiler or other convenient part of the engine or framing, are rods fixed near the wheels, and connected to the bottom of these rods by a ball-and-socket joint is a rotating skeleton frame. In this frame radial slots or openings are made to receive drums, which are free to turn therein, and to move radially in their slots. The frame is shaped and arranged so that it shall stand at a slight angle to the ground, and allow only the drums at the side near the wheel to touch the ground when the pressure of the wheel is upon them."

2. Gearing is provided by which the bearing wheels are driven in opposite directions, to facilitate turning at the headlands.

3. The implement is steered by steam, acting through spur gearing, or by a hydraulic cylinder and piston.

4. The digging cylinder, carrying the digging blades, is mounted in a frame resting on rollers, and capable of being raised and lowered by hydraulic power. The hydraulic apparatus is also caused to support a portion of the weight of the digger.

5. To "compensate for the irregularities of the surface," the leading wheels of the engine are connected by a "balance beam," or otherwise. The stems of the steering wheels also are fitted with plungers and work in hydraulic cylinders.

Methods of arranging the gearing for driving the digger cylinder, and of reversing either wheel to turn the apparatus, are described at length.

[Printed, &c. Drawings.]

A.D. 1857, October 15.—No. 2637.

BALDERSTON, ROBERT GLASS.—“Apparatus for cultivating land.”

A locomotive engine has a digging apparatus connected to it at the back. This consists preferably of a single serrated curved blade extending across the breadth of the engine and connected by several arms to a parallel bar above. This bar has its ends fitted to move in vertical guides. It has attached to it arms with studs thereon fitting on one side in a radial groove in a wheel driven by the engine, on the other is an eccentric groove of special shape in a plate opposite the wheel. The effect of this is to give the digging blade a motion which drives it down into the earth, and then tilts it up so as to lift and throw over the portion of soil separated. Coulters, fitted in front of the digging blade, divide the soil in a vertical direction. The slotted plate can be moved to regulate the action of the digger. The digger can be thrown out of gear when required, and means are provided for giving the engine a slow forward motion when it is at work, and a more rapid motion when it is travelling and not digging. Other improvements in the engine are also described.

[Printed, 10d. Drawing.]

A.D. 1857, October 22.—No. 2691.

BETHELL, JOHN.—“Apparatus for trenching, cutting, digging, and cultivating land.”

The invention refers to agricultural engines, generally and specially to those used for driving digging machines. It consists in adapting a portable railway to the wheels of such engines, “the said railway or roadway being constructed of a series of separate slippers, shoes, or pieces suitably disposed around the circumference of the running or bearing or other wheels.” The digger may be of the sort described in No. 949, A.D. 1852, or any other suitable sort, “and either worked by endless bands and pulleys, or by connecting rods direct, or by shaft and endless screw or other convenient means.”

The drawing shows a digging cylinder with curved blades mounted in a frame connected to the rear of an engine, fitted with the portable railway. The frame is pivoted to the engine carriage, and can be raised and lowered by chains.

[Printed, 10d. Drawing.]

A.D. 1857, October 29.—No. 2745.

**DELF, WILLIAM, junior.**—(*Provisional protection only.*)—  
Ploughs.

The following is the whole Provisional Specification :—

" My said invention relates to a novel construction of ploughs,  
" consisting in making them with a point running before for  
" opening the furrow, and having behind a V-shaped share ;  
" and attached to the hind part of the implement are two  
" short breastes for turning the soil out of the furrow. Linked  
" on to a bolt descending perpendicularly from the stump of  
" the beam are two metal wings, so formed as to scrape or  
" slide out such stuff to any part of the stretch or land, which  
" distance is regulated by a slide connecting the two wings.  
" It has also a simple lever arrangement between the handles  
" for raising and turning the plough."

[Printed, &c. No Drawings.]

A.D. 1857, October 29.—No. 2753.

**ROBINSON, GEORGE WILLIAM.**—"Clod-crushing rollers."

The improved roller is composed of a number of rings or sections, so placed on a longitudinal axle that only every alternate ring or section bears directly on the axle ; such alternate ring or section being furnished with a projecting boss, on which the next ring or section is mounted, and on which it turns freely. In place of forming the projecting bosses all on one side of the rings or sections, bosses of half the length may be formed on both sides of the same. " The  
" periphery of each ring is made with spikes or projecting  
" points, the two outer sides of which are made of a curved  
" form consisting of about a quarter of a circle ; the outer  
" sides of each point or projection are made to incline from  
" the periphery to the point." The rings or sections are  
" connected to their central naves or bosses by spokes."

[Printed, &c. Drawing.]

A.D. 1857, October 30.—No. 2758.

**HARWOOD, WILLIAM.**—Reaping machines.

The cutters are driven through the intervention of endless bands and pulleys instead of toothed gearing. The cut crop is

received on a set of endless bands with pins thereon, running across the machine. The rollers on which the bands run are mounted on inclined shafts, and are fitted with flanges, which prevent the pins carrying round the crop with them. The upright shaft which transmits motion to these inclined shafts is also fitted with a roller, to assist in passing the crop back. "The required pressure of the moveable upon the fixed cutters" is produced by "springs carrying rollers at their extremities to reduce the friction, or by means of a lever or levers mounted upon the end or ends of the cutter bar" and adjustable by screws. There are sometimes "two knives, one with a serrated edge, the other plain; the serrated edge runs free by releasing the rollers" above mentioned. A "forked lip" is attached to "the upper face of each of the lower cutters." A "divider" is used, which consists of a "jointed bar extending forward in advance of the machine with its fore end resting upon the ground, and carrying a frame which divides (and raises if necessary) the corn or other material to be cut." A second such "divider" on the other side may also be used. The cutters can be raised by a lever pivotted to a piece of metal affixed to the end of the shafts where they are connected to the machine. The "small or rear travelling wheel" is mounted on "an axle supported by a frame which is centered or swivelled at one extremity, and carries at the other a roller which runs upon a curved bar or frame supporting it, the object being to prevent the said wheel from working or scraping into the soil when the reaping machine is turned." Behind the machine a rake is fitted, which is held up by a spring, but can be depressed by a cord so as to gather the corn into sheaves at intervals. The gatherer can be raised or lowered by a lever. On the shafts is fitted "a curved backing bar or rod which rests upon springs, in such manner that when the horses lower their haunches in backing, the said bar or rod, against which their force is exerted, may yield to them and become depressed." "Between the whippetree and the point of the machine at which the traction of the horses is applied" there is fitted "a cranked lever or other suitable contrivance for balancing or counteracting, as far as may be, the side pressure exerted upon the horses."

[Printed, 10d. Drawings.]

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A. D. 1857, November 4.—No. 2803.

CLAY, CHARLES. —“Machinery for grubbing and cutting up weeds, and otherwise scarifying and cultivating land.”

The frame of the implement is constructed of iron, and is of an irregular triangular form; it is supported by three up-rights or standards, each capable of vertical adjustment and carrying a wheel at its lower end. To transverse “parallel bars or axes, each turning in bearings carried by the framings on each side of the implement,” are affixed the stems of tines, of various forms according to the work required to be done. “The stems of the tines are each bent back and then downwards, by preference in a curved form, to the point or end, and such stems are capable of adjustment on their bars or axes, and also of being readily removed to admit of others being applied in their places.” Each of the bars or axes “has a projection or arm at the upper part thereof, which arms or projections are by links or connecting rods attached to a lever having its fulcrum or axis at the hinder part of the implement, by which means the several tines may be readily raised from and lowered to the earth, and provision is made for guiding the lever and for fixing it in position.”

[Printed, 10d. Drawings.]

A. D. 1857, November 5.—No. 2811.

COUSINS, JOHN JAMES. —“Steam ploughs.”

A frame carrying the ploughing apparatus is mounted below a locomotive engine. The frame is fitted so that it can be raised and lowered by racks and pinions. The shares, each with a corresponding mould board, are arranged “in two diagonal lines extending from the front corners of the frame and meeting in or near the centre.” In front of each share is a screw on a shaft the end of which passes through the mould board and is then fitted with a pinion gearing with a pinion on a vertical shaft rotated by similar means from a shaft above set over the line of ploughs. These screws alone may suffice to propel the engine, or the running wheels of the engine may also be driven. At the back of the engine is a steering wheel, mounted so that the end of the carriage can be adjusted thereon as to height. A guide rope may be fitted to the machine, and led over a set of pulleys suitably arranged.

[Printed, 10d. Drawings.]

A.D. 1857, November 13.—No. 2859.

SHEPPARD, GEORGE. — (*Provisional protection only.*)—  
“Machinery for cultivating land, or for cutting up and  
“pulverizing the surface thereof.”

The improvements “consist principally in the employment  
“of a rotating horizontal plate-wheel frame or platform, which  
“is mounted on a vertical shaft supported in suitable bearings,  
“fixed on the framework of the carriage. On the underside  
“of this rotating plate wheel-frame or platform are fixed two,  
“three, or more vertical knives about nine inches long, or so  
“arranged and secured in their sockets as to project about  
“nine inches below the rotating frame, which must also be  
“capable of being raised and lowered at will.” As the  
machine is drawn over the land by horse or other power,  
motion is transmitted to the rotating platform or frame by  
suitable gearing from the running wheels; or, “it may be  
“convenient sometimes to drive the frame by different and  
“separate means.” Upon lowering the rotating frame, when  
in motion, “the vertical knives on the under side thereof will  
“be made to enter and cut into the surface of the land.”  
Other knives, in addition to the knives of the rotating frame,  
may be used in connection with this machine. “Rollers or  
“clod crushers may also, if desired, be adapted to the  
“carriage and used in combination with the rotating plat-  
“form or frame”; or, if preferred, the same may be used  
separately.

[Printed, &c. No Drawings.]

A.D. 1857, November 19.—No. 2897.

SMITH, WILLIAM. — “Apparatus for the purpose of pro-  
“tecting the turnip crop, by destroying the turnip fly and  
“other insects which are injurious to turnips and other  
“plants.”

The insects, during the onward progress of the apparatus,  
which is to be pushed from behind by manual or other power,  
are removed from the plants by light and elastic brushes, and  
deposited in a cell or trough placed inside the machine. Rows  
of the said brushes are fastened round an axle-tree, which  
derives revolving motion, through the medium of friction  
wheels, cords and pulleys, or wheeled gear, from an axle-tree



to which the travelling wheels are attached. "The brush  
 "axletree can be raised when requisite (in accordance with  
 "the height of the plants), by means of adjusting screw bolts  
 "and nuts placed at the side, and passing perpendicularly  
 "through the wooden rail of the framework and an iron stay  
 "attached to the rail of the framework underneath;" or, the  
 adjustment of the brush axletree may be effected by means of  
 a crank lever. As the brushes revolve, they come in contact  
 with the edge of the cell or trough; or, when two cells or  
 troughs are fixed, at back and front, inside the machine, the  
 brushes strike against a rod placed above the brush axletree,  
 whereby the insects are knocked off into the cells or troughs,  
 which contain "a glutinous or some adhesive composition to  
 "prevent their escape and to destroy them."

[Printed, 10*d*. Drawing.]

A.D. 1857, November 30.—No. 2978.

HOWARD, JAMES.—"Construction of ploughs."

The invention relates, firstly, to the construction of the plough  
 beam, which is formed "of bar iron with a double flange at  
 "the upper edge, which flange tapers off in opposite direc-  
 "tions from near the point where the beam is united to the  
 "frame, at which point there is the greatest strain upon the  
 "beam, both laterally and vertically." Secondly, "to an im-  
 proved mode of fixing to the beam the slides which carry  
 "the wheel stalks," by forging on "to the furrow side of the  
 "beam, a bearing piece or bearing pieces." "The slides  
 "which carry the wheel stalks are passed through slots in the  
 "beam and bearing pieces, and between these two bearing  
 "points," the patentee says, "I introduce a loop screw which  
 "takes hold of the slides, and by the application of a nut on  
 "the end of the screw draws them tight in the direction of  
 "the length of the beam." Thirdly, to a mode of construct-  
 ing the frame of the plough "of bars of iron, either ribbed  
 "or plain, in place of the ordinary cast-iron frame, or of  
 "the wrought-iron frame" described in a former Patent,  
 No. 237, 1855. "These wrought-iron bars, I set at such a  
 "distance apart, as to admit of the insertion between them of  
 "the plough beam, and the share neck or lever, and I connect  
 "them to the beam and to each other, so as to ensure a proper

" amount of stiffness for the frame. To the inner face of one  
" of the forward bars, an ear or lug is welded or fixed to receive  
" the front pin which fastens the breast to the frame."

[Printed, Ed. Drawing.]

A. D. 1857, December 2.—No. 2994.

FOWLER, JOHN, junior, and WORBY, WILLIAM.—"Apparatus used when ploughing, tilling, or cultivating land."

The invention consists, firstly, in the combination of upright winding drums or barrels, whether geared together or otherwise, and driven by steam or suitable power, with an endless hauling rope, and also "the so arranging the apparatus that the hauling rope may take one or more turns round both of the upright barrels or drums," and around one or more drums or pulleys, fixed or anchored at a distance. The winding carriage is so contrived that it can be connected with a steam engine, the power of which is communicated to one of the winding drums, both of which may be geared together by an intermediate pinion.

Secondly, in attaching to the plough or cultivating implement, which is arranged to travel in both directions, an apparatus for taking up the slack of the wire rope or drawing tackle. The apparatus consists of "two drums mounted on axes carried by the frame, on each of which a considerable length, say 50 yards, more or less, of the hauling rope is wound." On the flanges of these drums teeth are formed, which gear into the teeth of pinions, the respective axes of which have handles applied, "by turning one of which, according to the direction in which the plough or implement is travelling, the slack of the return rope is taken up." "The hauling rope on the headland, opposite to that on which the winding carriage and engine traverse, passes round a pulley, mounted on an anchor carriage, similar to that described in the specifications of former Patents." "By using a hauling rope thus practically endless, the wear of the return rope is greatly diminished by its being kept tight, and to a great extent off the land." This arrangement also enables a second implement to be placed on the return rope, as, for example, when working with a scarifier, a harrow can be put on the return rope, so as to traverse backwards and forwards immediately behind the scarifier.

[Printed, 2s. Drawings.]

A.D. 1857, December 4.—No. 3011.

SEWERS, SAMUEL HENRY.—(*Provisional protection only.*)—

" Powder for dusting turnips, and machinery for distributing  
" the same."

The invention "consists, firstly, in the combination for the  
" above purpose of the following ingredients, namely, one part  
" gypsum, two parts ashes, and one part soot, saturated with  
" ammonia; and, secondly, of a machine or apparatus consist-  
" ing of a hopper for containing the said powder, or otherwise  
" communicating with a cylindrical chamber provided with a  
" slot opening extending throughout the entire length of the  
" lower portion thereof, through which the powder is distri-  
" buted by the action of a cylinder furnished with brushes on  
" the periphery thereof being caused to revolve through the  
" intervention of tooth and pinion gear in connection with the  
" axle of the running wheels, the said cylinder being provided  
" with trap openings or slides for regulating the discharge of  
" the powder to the number and width of the rows to be  
" operated upon." This apparatus also may be used for the  
distribution of artificial manure.

[Printed, &c. No Drawings.]

A.D. 1857, December 7.—No. 3031.

REEVES, ROBERT and REEVES, JOHN.—(*Provisional protec-  
tion only.*)—" Implements for depositing seed and manure."

To each of the counter levers of the improved implement is  
attached "a small box or hopper, which communicates by a  
" pipe with the main seed or manure box carried by the car-  
" riage." In each of the said boxes or hoppers is a vertical  
axis, which has mounted at its lower end a circular plate,  
having holes in it, and which, when motion is given to the  
axis, revolves in close contact with the bottom of the box.  
" At one part of the bottom of the box a hole is formed, and  
" when the holes in the revolving plate come up to this hole,  
" the seed or manure which they contain falls out directly on  
" to the land;" "a brush placed above the revolving plate,  
" and vertically over the hole in the bottom of the box,"  
serving to regulate the delivery. "In place of attaching the  
" measuring instruments as above described to the counter  
" levers, they may be attached to a bar fixed to the frame of  
" the implement."

[Printed, &c. No Drawings.]

A.D. 1857, December 17.—No. 3104.

WOOFFE, WILLIAM. — (*Provisional protection only.*)—Ploughs.

The whole Provisional Specification is as follows :—

" My invention consists in placing behind the coulter, and so  
" as to act upon the earth being turned over upon the mould  
" board, a toothed roller or revolving harrow, whereby the earth  
" is pulverized or divided while the ploughing operation is being  
" performed, and during the formation of the furrow ; also for  
" the better dividing of the earth," the inventor says, " I fit  
" upon the mould board one, two, or more blades. In order  
" to diminish the draft of ploughs I mount a small wheel at  
" the rear end of the sole of the plough, and carry it upon a  
" slide or small shaft held at the back of the beam of the  
" plough. I fix the coulters in ploughs by causing the coulter  
" rod to pass through a box or sheath wherein it is held firmly  
" at the upper part, but is free to play within limits in the  
" lower part thereof ; then by means of two adjusting screws,  
" one on one side and the other on the opposite side, I regulate  
" the position of the coulter."

[Printed, 4d. No Drawings.]

1858.

A.D. 1858, January 16.—No. 72.

AUSTIN, JAMES. — " Machinery or apparatus for ploughing or  
" cultivating land."

The machinery consists of a triangular open frame, supported upon wheels, and having at the forward end an upright boiler and steam engine, with an overhead crank shaft so connected by gearing with a forward ground wheel, which is also the steerer, that the movements are not affected by the working of the frame upon its supporting springs. " The  
" extreme back of the framing consists of a pair of ploughing  
" guides extending out transversely, as regards the path of  
" the machine, to a distance sufficient to cover the extent of  
" ground to be ploughed at once in the lengths of the furrows  
" which run across the field's breadth. This portion of the  
" framing carries a set of four large wheels or chain pulleys  
" over which are passed two distinct chains or ploughing

"belts. The two contiguous chain pulleys near the centre of the machine are actuated in reverse directions from the same engine which drives the front ground or travelling wheel, so that the forward traverse of the machine at right angles to the lines of furrows bears a determined relation to the rate of the ploughing chains at right angles with this forward traverse." The parts and the gearing, however, may be so arranged that, after each traverse length has been ploughed, the whole implement may be moved forward to the necessary distance for another furrow. Each ploughing chain is "fitted with ploughs or cultivators, which, as the machine works, continually enter the ground to plough it up in their bottom traverse, and emerge from the ground to return free in their upper back traverse." The patentee does not confine himself to the precise details as described, but what he claims as his invention is,—

"First, the general arrangement and construction of machinery or apparatus for ploughing or cultivating land by means of steam power," as described.

"Second, the system or mode of ploughing or cultivating land by means of steam machinery, in which the ploughs are caused to traverse in opposite directions from the centre of the machine outwards, or in the reverse direction from the outer part of the guides towards the centre of the machine."

"Third, the system or mode of ploughing land by means of machinery, in which the ploughs are caused to traverse along suitable guides placed at right angles or nearly so to the main framing of the machine, and in which two or more ploughs are caused to act simultaneously in cutting the furrow, whilst two or more ploughs are traversing along the upper parts of the guides preparatory to their being brought into operation."

"Fourth, the system or mode of ploughing lands by means of machinery, in which sets of ploughs are alternately brought into action."

"Fifth, the system or mode of arranging and constructing the mechanical details in connection with the engine or propelling power of ploughing machines, so that the implement is propelled forward a distance equal to the width of a furrow at each traverse of the ploughs."

"Sixth, the system or mode of guiding or steering ploughing machines by means of the mechanical arrangement herein-before described, or any mere equivalent therefor."

[Printed, 10d. Drawing.]

A.D. 1858, January 27.—No. 146.

MOTTRAM, THOMAS, EDWARDS, JOHN, and MITCHELL, JOSEPH. — (*Provisional protection only.*) — "Rolling steel, iron, and other metals, and also for tilting the same for cutlery and other purposes."

The following is the whole Provisional Specification:—

"That our invention consists in rolling steel, iron, and other metals for cutlery and other purposes, instead of being forged as in the way now in use. The roller or rollers to be so cut, fluted, or bevilled as to form the steel, iron or other metal of the required shape, and afterwards to be cut into proper lengths for table knives, butcher knives, bowie knives, for knives usually made for cutting cane in the manufacture of sugar, cotton, and other foreign produce, also for razors & scythes, and for other implements for farming purposes, and for swords, bayonets, and other implements of war, for which this invention of rolling of steel, iron, and other metal can supersede the usual methods of forging."

[Printed, 4d. No Drawings.]

A.D. 1858, January 30.—No. 173.

COLEMAN, RICHARD. — "Agricultural implements."

The invention relates, firstly, to "apparatus or gear for raising or lowering the tines, hoes, or other instruments used in ploughing, hoeing, or scarifying land." Hitherto, and in particular as described in the Specification of a former Patent, No. 10,685, A.D. 1845, the said apparatus has "consisted of a single lever fixed on the barrel or shaft, to which all the instruments were connected, and thereby moved." According to this invention, this hand lever is placed on a fulcrum near the fore part of the frame, and is connected by a link or rod with an arm or lever fixed on the barrel. To this hand lever is connected, by a suitable link or chain, a second



hand lever, mounted on a fixed fulcrum at the rear of the frame, and which is caused so to act upon the first hand lever as to bring the same within reach of the attendant, and also to afford a compound leverage, when great power is required to move the instruments in the ground.

Secondly, to another improvement in hoeing, ploughing, or scarifying implements. This consists "in extending the breadth of the framework at the back part, and placing instruments to act on the soil immediately behind the wheels."

Thirdly, to the fixing of the shares or cultivating instruments to the coulters or tines of agricultural implements. The end of the tine is furnished with shoulders, against which abut cheeks or shoulders on the share; whilst a thinner part of the tine which is received in a cavity or mortice in the share, has a projection formed on its upper part, on which the share hooks. This thinner part of the tine may be furnished with vertical ribs on either side, for the purpose of fitting into corresponding grooves in the socket of the share.

[Printed, 10d. Drawings.]

A.D. 1858, February 6.—No. 225.

**BALL, WILLIAM.**—"Construction of ploughs."

The improvements relate to "the construction of that kind of plough which has the nose (that carries the share) cast in one with the plough frame," and consists in lengthening the neck of the plough "elongating at the same time the breast or mould-board, which in consequence receives a more gentle inclination, and is therefore capable of passing more easily through the soil; and to prevent the choking of the plough at the throat," the inventor says, "I throw back the throat and increase the depth of the plough frame."

"Instead of tapering off the plough frame in a continuous line to the point of the nose as usual, I throw out a shoulder at the part where the nose commences, and thus get an increased breadth of nose, which gives it greater strength and enables it to hold the share firmly when the plough is working upon hard ground. For the purpose of fitting on to the nose the share is cast with a broader socket than usual, which increases the strength of the share. The sole plate

" (which takes somewhat the form of angle iron) I propose to  
" make longer than heretofore, to adapt it to the increased  
" length of neck, and also to make it higher than usual in this  
" class of ploughs in order more effectually to protect the  
" land side of the plough from wear."

[Printed, 6d. Drawing.]

A.D. 1858, February 9.—No. 243.

TAYLOR, JOHN.—(*Provisional protection only.*)—"Construction of horse hoes, applicable also to drills."

The hoes are mounted on independent levers, which "are  
" severally jointed to the forward end of a balance frame;  
" this frame has for its fulcrum, by preference, the axle of  
" the running wheels, and it is also made capable of sliding  
" laterally thereon." A steering rod, which passes from the  
front to the rear of this frame, and rests in suitable bearings  
in the same, so as to permit of its receiving an axial motion  
from the hand of the attendant, has its inner or forward end  
connected, by means of a segment and rack or other gearing,  
with the axle of the running wheels. By this arrangement  
the hoes can be moved both laterally and vertically, the guide  
rod being used as a lever for lifting the hoes out of the ground.  
" The above-described arrangement applies also to drills, and  
" serves to facilitate the adjustment of the coulters while those  
" implements are in operation."

[Printed, 4d. No Drawings.]

A.D. 1858, February 11.—No. 259.

JOHNSON, CHARLES, and JOHNSON, GEORGE.—"Apparatus  
" for performing different operations required in agricul-  
" ture."

The apparatus consists of an engine and a "carrier frame"  
to which various implements are attached. The engine may be  
used as a locomotive and draw the carriage with the imple-  
ments after it, or it may move separately and draw the carriage  
up to it by a rope.

The description in the Provisional Specification is longer  
than that in the Final; according to the latter:—"The reap-  
" ing machine consists of a revolving or semi-rotary plate and

“ cutters, fitted with revolving rake drums, both moving upon  
“ a vertical axis upon the same centre, but in opposite direc-  
“ tions, and at unequal velocities; the drum rakes move  
“ to the right and left inwards to the centre line of the machine  
“ longitudinally, the revolving cutters both ways outwards  
“ from the said central line. The drums and cutters are  
“ actuated by corrugated grooved wheels and cables or chains  
“ adapted thereto. The cutting blades have a peculiarly formed  
“ edge which prevent the stalk from riding by its S-like form.  
“ These cutters when driven in a reciprocatory curved line are  
“ made double edged, or they may be made to cut in one  
“ direction only, and with an advancing and receding curved  
“ line motion laterally similar to that of a common scythe in  
“ mowing, by being attached to a plate moving upon an eccen-  
“ tric axis.” “The drums and cables for driving or hauling  
“ the carrier frames are capable of being fitted either to the  
“ engine or the frame. The carrier frame may be single or in  
“ duplicate; when single they are made open in the front, and  
“ so much wider than the propeller frame as will admit of the  
“ fore wheels and fore part passing along outside of the pro-  
“ peller frame, in which case the ploughs are brought up  
“ close to the tail of the latter.” The ploughs are fitted  
“ even with each other in the same square line transversely,  
“ and not diagonally,” so as not to leave “the angles at the  
“ headlands unturned.” “The plough breasts are made of  
“ sufficient length to continue the spiral surface until it be-  
“ comes horizontal at the tail, and thus turn the flag com-  
“ pletely over and lay the flags edge to edge flush without  
“ lap; these breasts are fitted with a share and coulter at the  
“ head and to a horizontal bar at the tail, by which the breasts  
“ are both supported, kept in gauge, and driven. They are  
“ fitted to a frame with longitudinal horizontal bars which  
“ radiate upon cross bars, by which these breasts can be ad-  
“ justed to the required gauge at the share or head, and  
“ between which vertical stems are supported and are also  
“ adjustable to any height; the breasts are also moveable  
“ upon the tail bar” for adjustment. “The harrows and  
“ drills of this apparatus are placed immediately in the rear  
“ of the ploughs” and are rotated from the running wheels of  
“ the carriage. The drills are not described in the Final Speci-  
“ fication. “The harrows consist of a shaft or barrel with

“projecting teeth and studs driven by a pulley at the end. One of these harrows is fitted in front of the drills, and one in the rear of the same frame.” The hinder harrow is driven by “mould chains,” which pass round both barrels, and between the coulters of the drills, mould dressing the surface and clearing the drill coulters at the same time.” The frame has “wheels with moveable axles,” having a “vertical motion to admit of the end of the frame being elevated and depressed when turning.” “The harrow and drill frame is lifted bodily by a lever in a carrier frame, and the ploughs with the frame itself by a drop lever.” “When the ploughs are used for paring they are fitted with small revolving harrows and rising and falling pressers for throwing up the weeds and pressing them into the bottom. These pressers have a rolling as well as a lifting and falling motion.”

The following seem to be the principal points in the Provisional Specification additional to the above quoted passages:—

The carriage has a “drop fulcrum,” “to let down between the side frames to answer the purpose of a second fulcrum for raising the whole of the hind frame, ploughs, &c., and hind wheels together clear of the ground.” “The hind wheels are also formed & provided with grooves, cables, &c.,” “and thus give motion to the moveable parts of the ploughs, harrows, and drills, as well as to the reaping and mowing machine by means of similar wheels therein with corrugated grooves or levers or cones, or any other means of diverting the line of draught.” By detaching the implement the carriage may be converted into a waggon. The harrows have “a rising and falling motion to clear themselves and also a zig-zag motion.” The drills “consist of stems and coulters with openings at the back, inclined at an angle of about 60° with the horizon.” They have no “telescopic or flexible tubes,” “but are furnished with revolving cupped wheels,” which deliver the seed from a trough to a sloping surface behind the coulter. The drills “have each a rising and falling motion.”

The various implements “can be mounted upon their own wheels, and driven by animal or other power.”

[Printed, i.e. Drawing]

A.D. 1858, February 11.—No. 263.

THORRINGTON, GEORGE.—(*Provisional protection only*).

—“A method of propulsion applicable to agricultural purposes.”

The following is the whole Provisional Specification :—

“The invention consists in the use of a right and left handed screw, placed parallel to each other near the surface of the earth, and revolving in opposite directions to each other in bearings supported on a suitably contrived frame, which is borne on running and guiding wheels. The blades of the screws in their revolution take in the soil and so effect progression. The screws are set in motion by appropriate gearing driven by steam or other suitable power.”

[Printed, 4d. No Drawings.]

A.D. 1858, February 17.—No. 300.

BOYD, JAMES EDWARD.—“Lawn and grass mowing machines.”

So far as can be ascertained from the description given, this invention is intended solely to apply to lawn mowers. The patentee however states at the close of the Specification that the improvements are applicable “for all lawn and grass mowing and reaping machines.” It is therefore noticed here. The principal heads of the invention seems to be ; — fitting a brush or other guard before or against the revolving cutter ; adjusting the height of the cutter ; and modifying a roller fitted to the machine when “cutting round grass verges and borders.”

[Printed, 4d. No Drawings.]

A.D. 1858, March 1.—No. 403.

PLATT, HENRY MORTIMER.—“Ploughing and tilling land.”

The invention, which is “designed to facilitate the employment of steam as a motive power as well as the power of men and animals,” “consists in the use of a revolving screw-shaped share, supported upon a wheeled carriage, and so coupled and geared to the wheels that as the machine advances the screw-shaped share will enter the ground and be made at the same time to revolve with a certain velocity

“ according as it is geared with the wheel and also proportional to the speed of the latter. As the furrow slice is lifted it is at the same time so completely cross-cut by the revolving share as to effect its proper pulverizing, whereby it is left fit for the immediate planting of seed, and the harrowing operation is thereby saved.” “ The screws may be made of several blades, thus forming two, three, or four-threaded screws. The screw starts at its point as two-threaded, and near its upper and largest part it has two other blades attached so as to make it four-threaded at and near its rear end.” “ In ploughing by steam a number of the screws can be arranged across one frame, and be operated by a single pair of wheels;” variations may be also made in the shape of the screw cutters.

[Printed, 6d. Drawing.]

A.D. 1858, March 6.—No. 464.

MAISSIAT, JACQUES HENRI MARIE.—“ Dibbling machinery for depositing grain and manure.”

Improvements on No. 531, A.D. 1857. The implement is intended to perform all the operations of agriculture between ploughing and getting in the crop, “ for sowing by means of dibble holes or in furrows ” “ proportioning and distributing manure, either liquid or in a pulverized state,” “ ridging, hoeing, or weeding, or earthing up the plants,” “ forming watercourses without displacing the plants.”

The following is the “ special mechanism of the apparatus ” :—

“ 1st. A principal roller which consists of a heavy cast-iron roller having as many separate discs or wheels as it is required to sow lines of seed.”

“ 2nd. A distributing cylinder of the seed rotating simultaneously with the principal roller.”

“ 3rdly. A distributing cylinder of manure in a pulverized state.”

“ 4thly. A reservoir of liquid manure which is distributed in lines in regulated proportions, with a constant flow on the principle of Mariotte’s flask.”

“ 5thly. Cast-iron ploughshares with a double turn-fallow, and turning on axes and disposed between the lines of sowing.”



"6thly. The machine is completed by a second or pressing roller consisting of a wood cylinder with an undulating surface, according to the form of ridge it is required to produce."

The apparatus is mounted on the shaft carrying the main roller which forms the furrows for the seed. Behind this is a roller, hollow within and containing the seed; seed cups are arranged to take the seed up and deliver it through suitable apertures to the furrows. A similar apparatus may be used for manure, either liquid or pulverised, and it may be mounted either in front or at the rear of the machine. Shares are fitted to cover in the seed, or they may be mounted in front of the machine and used for hoeing. The liquid manure is supplied from a reservoir communicating by a pipe with a well, whence the manure passes to the distributing cylinder. A roller is fitted at the rear of the machine. The whole frame swivels on the shaft of the main roller and can be tilted by a lever and chain, to raise the hinder part off the ground, so that the machine rests only on the roller.

[Printed, 1s. 6d. Drawings.]

A.D. 1858, March 8.—No. 467.

LYNE, THOMAS.—Harrow.

The harrow is composed of beams, preferably curved or bent in a horizontal plane, and furnished with tines. These beams are connected to the draught-bar by a sort of pin-joint, there being loops on their ends and also loops on the draught-bar, with a bar passing through both sets of loops. The beams are thus enabled to rise and fall independently when passing over inequalities in the ground. Their hinder ends are connected by slotted links. When it is required to render the frame rigid, a cross-bar is fixed across. This bar is lugged at one side of the frame and when not in use is held by a screw to the beam at that side; when in use it is passed under a catch on each beam and secured to the beam on the other side by its screw. Several harrows may be connected together by similar means.

[Printed, 6d. Drawing.]

A.D. 1858, March 13.—No. 517.

OSMOND, STEPHEN THOMAS and COLLINS, EDWIN DAN-  
DRIDGE.—Ploughs.

The improvement consists in fitting the fore carriage of a plough with a rack and pinion, by which the head of the plough can be raised or lowered while at work. The pinion is driven by a worm on a light shaft extending back to the handles of the plough, and there fitted with a hand wheel. This shaft has preferably a double joint on it.

[Printed, 6d. Drawing.]

A.D. 1858, March 17.—No. 538.

CLARK, WILLIAM STETTINIUS.—(*A communication from Walter A. Wood.*)—"Machines for cutting and harvesting grain and grass crops."

1. The frame at the back of the cutter-bar is made removable, so that it, and the outer bearing wheel which is attached thereto, can be removed in cutting tangled grass, &c. In front this frame is connected to the shoe on the end of the cutter bar by a pin, and at the back it seems to be fixed by a bolt to the hinder part of the machine. The removable frame is triangular, being only secured at two opposite corners.

2. The "castor wheel," on which the front of the machine is supported, is mounted on a block hinged to the framework of the machine so as to rise and fall therewith. A lever is rigidly fixed to this block, and by pinning this lever to a standard on the framework of the machine, the cutters can be raised. The "tongue" is formed with arms which pass on either side of the block and are pivoted to the hinge bar. The tongue and block can be pinned together when required.

3. For throwing the driving apparatus of the cutters into and out of gear, the inventor uses a "clutch lever with cam planes." This consists of a bar slotted so as to slide over the driving shaft between two collars; on each side of the bar are inclined surfaces so that by drawing it up or down it acts against one or other of the collars and slides the shaft one way or the other, thus throwing a bevel wheel thereon into and out of gear.

Besides the above, the Provisional Specification has the following passage, to which no reference appears to be made in the Final Specification :—

"Fourthly my improvement consists in the peculiar device used for dividing the grass or grain to be cut from that which is to be left standing, as that there shall be no 'combing,' or 'ridging,' or bending down of the grass so as to prevent the cutters from taking it, but so that a perfectly smooth mown surface shall appear without showing the swarths of the machine; this is effected by the peculiar shape of the dividing shoe."

[Printed, 2s. Drawings.]

A.D. 1858, April 3.—No. 710.

FOWLER, JOHN, junior.—"Apparatus used when ploughing, tilling, or cultivating land by steam power."

The Specification describes a method of ploughing by two engines on opposite headlands, both of which act at the same time to draw the plough. The rope is an endless one, and the ends are secured to drums on the implement frame. Before starting on each bout, the traction rope revolves the drum on which it is coiled, and this is so geared with the other drum that it causes it to revolve more rapidly, and thus wind up the slack of the return rope. As soon as all the slack is taken up, the brake is put on and the drum prevented from revolving, when the traction rope commences to put the implement in motion.

[Printed, 1s. 6d. Drawings.]

A.D. 1858, April 3.—No. 711.

CROWLEY, WILLIAM.—"Combining and working ploughs."

Several double ploughs are connected to a pair of draught frames, one at each end. The form of the draught frame is preferably triangular; the draught rope is connected to the end of a rod pivotted to the centre of the frame, and attached at its other end by a pin to the side of the frame. The effect of this is that the draught being at the corner of the frame, all the ploughs are brought close together, and in that position they traverse the field. On nearing the headland the pin is taken out of the bar, and the draught is thereby removed to the centre of the frame, whereby all the ploughs are caused to separate, assuming a position at right angles to the frame. They are then tilted, the draught applied to the other frame, and they are drawn back across the field, in

starting to do which they "will enter new ground, and form a  
" new furrow parallel to the previous furrows."

[Printed, 10d. Drawing.]

A.D. 1858, April 8.—No. 720.

CLARK, WILLIAM STETTINIUS. — (*A communication.*) —  
" Grain and grass harvesting machines."

The main running wheel is mounted so that its journal may be fitted into any one of a number of holes at different heights, but all arranged so that the spur wheel on it shall always be kept in gear with the pinion driving the gearing. A crank shaft driven by bevel gearing from this pinion actuates the cutter by means of a connecting rod. On the shaft carrying the pinion is a universal joint, connecting the shaft with a second shaft "which has upon it a square sleeve supported by  
" and moving vertically between two guides, the object being  
" to allow the shaft to have uninterrupted motion on its  
" sleeve, whilst the sleeve is free to carry said shaft. On the  
" shaft beyond the sleeve is a second universal joint, to which  
" a perpendicular rack is attached, so as to allow the rack to  
" turn with the sweep of the rake. On the extreme end of a  
" third shaft is a spur wheel, which takes into an endless  
" rack attached permanently to a curved plate, which is a  
" fixture on the frame of the machine, both the rack and the  
" plate being curved in the arc of a circle whose centre is at  
" the second universal joint, so that the pinion or spur wheel  
" may remain in gear with said rack whilst it goes through  
" its necessary 'change motion,' to give the rake its traverse  
" and rising and falling and turning movement," the rake  
being carried on supports on a plate over the shaft and hinged horizontally to the frame so as to be free to travel backwards and forwards as the pinion runs over the endless rack. The perpendicular rack before mentioned passes through an aperture in this plate and gears with a pinion on the rake stem so as to revolve the same. The rake stem is cranked, so that its revolution causes the rake to be raised as well as revolved. There is a bow on the back of the rake, to help in separating the corn lying on the platform from that falling from the cutters. "When the machine is used as a reaper the tongue  
" is held ridged (? rigid) between the standards by a bolt  
" passing through the rear end of the tongue and through

" standards; when used as a mower for grass the rake and platform are removed." Also an additional small wheel is fitted on the frame in front of the main running wheel. A reel is used when the apparatus is reaping. In order to regulate the size of the sheaves there is a clutch actuated by a foot lever which throws out of gear the mechanism of the rake. When the corn is thin the rake is thus held out of action till enough has accumulated to form the sheaf. The finger-bar is formed of a doubled plate of sheet metal, the fingers being inserted through holes "in the front and rounded portion of the bar, these fingers being gripped and pinched between and by the lips of the bar in the rear, and secured by bolts."

[Printed, 1s. Drawings.]

A. D. 1858, April 6.—No. 731.

HORNSBY, RICHARD, junior.—Ploughs.

" In constructing the alipe slide or sole plate it is formed of wrought iron or malleable cast iron, the hinder part being suitably arranged for receiving a suitable shoe or continuation by preference of cast iron or steel. The fore part or nose of the alipe slide or sole plate is made hollow, with a spherical bearing to receive a spherical part on the lever, to the fore end of which the share is fixed. The fore part of the breast is fixed to the fore part of the sole plate, and not as heretofore, to the frame of the plough. The fore part of the frame of the plough enters into the hollow fore part of the alipe slide or sole plate, which offers a socket to receive it, and the fore part of the frame of the plough is fixed in such socket or hollow part of the sole plate. The hinder end of the lever to which the share is fixed, is arranged to have an adjustment up and down, as heretofore, and also laterally. The hinder part of the frame of the plough is fixed to the sole plate near its hinder part, where it is arranged to receive and have affixed to it a shoe or continuation as above explained. The coulter is formed, by preference, with two cutting edges, and at its upper end it has a rod and tang or is formed to enter into and be fixed in a tubular stem, so that the tubular stem may be again and again used with different coulter blades."

[Printed, 10d. Drawing.]

A.D. 1858, April 12.—No. 791.

RATEL, PIERRE. — "Machine for depositing grain and  
"manure."

A frame is mounted on two pairs of bearing wheels. The front pair are connected to a single stem which supports the front part of the frame; the hinder pair are situated about the middle of the frame and may either run loose on their axles, or be fixed fast thereon by pins. In front of the axle are two cross shafts fitted with coulters, and behind are two similar shafts. The front sets form the furrows for the grain; the second sets, the coulters of which act intermediately of those in front, serve to cover up the grain. These shafts are fitted in frames mounted so as to turn over and raise the coulters from the ground, or the coulters may be set to slide vertically and horizontally on the supporting shafts. The seed distributing apparatus is formed of a solid cylinder with holes therein revolving under a hopper with compartments from which grain and manure are delivered to the holes in the cylinder. The cylinder is fitted on the axle of the running wheels, and springs are applied thereto in a manner not very clearly described to give it a jogging motion. Below the cylinder is a row of conductors which guide the seed, &c. to the furrows. A rake is mounted behind the apparatus, and attached thereto is an arm carrying a roller resting on the periphery of a toothed wheel on the axle, in order to give the rake a "to-and-fro movement by which means this instrument "acts as a weeder for separating by successive shocks the "earth from the roots and the grass." The seed-box, &c. may be removed and the apparatus used "for rooting up "weeds or as a scarifier."

[Printed, &c. Drawing.]

A.D. 1858, April 14.—No. 808.

GRAY, JOHN.—Ploughs.

1. The body, head, beam, and stilt, may all be made in one piece, or the beam and stilt or either of them may be separate, and bolted to the forging formed of the body, &c.

2. Instead of the share being fitted direct on the head, the share is fitted on a separate socket, and this is fitted on the head. The share is of cast iron, wrought iron, or steel, and



the intermediate piece of wrought iron or steel. By this means "the part which has the greatest strain to bear, is made of sufficient strength, while the sock or point, which wears rapidly, is easily and cheaply renewed."

3. The coulter is secured by a "loose wrought-iron clamp," which fits over both the coulter and the beam, and is secured by wedges.

4. This improvement consists in the use of "an adjustable" bridle adapted to the bar, to which the drag plate is jointed." The drag plate is connected to the end of the beam by a bar sliding vertically in a socket therein. To the end of this bar is also attached a rod with a swivel joint and tightening screw, the other end of which rod is connected to the body, or the beam close to the body. The object of this is to strengthen the beam and take part of the draught therefrom.

[Printed, 10d. Drawings.]

A.D. 1858, April 14.—No. 810.

**GREEN, EDWARD.**—"Implements for harrowing, pulverizing, cleaning, and breaking up land."

A pair of spiked rollers is set in a frame mounted on running wheels with the axes of the rollers at an angle to the line of draught. The ends of the rollers are together at the front of the machine, and their hinder ends are wider apart. The rollers "will be allowed to revolve either continuously or at intervals." There is a "hand wheel connected with an arrangement of rods and nitre wheels for elevating and lowering the rollers."

[Printed, 6d. Drawing.]

A.D. 1858, April 17.—No. 846.

**LUCK, THOMAS.**—"Machinery for raking and seeding land."

The apparatus consists of a horse rake combined with a seed drill. The tines of the rake are raised by a bar linked to a bell crank lever, worked by a long curved lever handle, apparently intended to balance in any position. The coulters and corresponding seed tubes are fitted in front of the rake on arms pivotted to the frame, and there are projections on the coulters which, when the tines are raised to their full extent, engage therewith, and thus the coulters are lifted. The tines

also can be raised, though not to their full extent, without affecting the coulters. The end tubes are supplied from a box and cup wheel.

[Printed, 8d. Drawings.]

A.D. 1858, April 20.—No. 863.

CLARK, WILLIAM STETTINIUS. — (*A communication from Peter Hannay.*)—(*Provisional protection only.*)—"Cultivator tooth for agricultural purposes."

The following is the whole Provisional Specification :—

"The improvements consist in forming a sheet metal cultivator tooth with a hollow shank, upon which a screw thread is cut, by means of which it can be fastened to the frame by a nut, the shank for this purpose being passed through a mortise formed in the frame of the machine. In forming the tooth, it is first cut out of a sheet of metal, and then swaged into shape, and the shank bent into cylindrical form, and a screw thread cut upon it, when the operation is completed."

[Printed, 4d. No Drawings.]

A.D. 1858, April 20.—No. 865.

FINLAYSON, GEORGE. — "Apparatus for sowing or depositing seeds."

The machine consists of a long box, mounted on a pair of running wheels, and drawn by a pair of shafts in front. Each wheel has a very large nave, large enough to allow the seed box to pass through and be supported thereon. The box projects a considerable distance outside the wheels. It is triangular in section, and has on it where it passes through the nave a circular plate with friction rollers running on the inner surface of the nave. There is also a wheel with internal cogs gearing with a pinion on a shaft running along the bottom of the box and carrying small vane wheels which as they revolve distribute the seed through holes in the bottom. These holes are covered by sliding plates worked by levers and regulated as to the amount of their traverse by screws. The box can be tilted over more or less by a lever secured to the draught bar. For transportation, the seed box and wheels are to be transferred to a carriage in which it can be placed longitudinally, and the shafts affixed to this carriage.

For sowing turnips, &c. a number of hoppers each with its own seed tube are to be used.

[Printed, &c. Drawings.]

A.D. 1858, April 24.—No. 910.

HORTON, JOHN.—Horse hoe.

The apparatus consists of a rotary hoe for thinning the rows, combined with fixed hoes for weeding between the rows. The fixed blades are angular, and are mounted on a transverse rock shaft in front of the machine. They can be raised by a lever, which is also connected to a slotted bar acting over a pin on an arm attached to the frame carrying the rotary blades, so that by depressing it the frame and rotary blades are raised by the same motion as the fixed blades. The rotary blades are mounted on radial arms carried by an inclined shaft lying in the line of progress of the machine, so that the hoes act at right angles to that line. The blades are mounted on the hinder end of this shaft, and on its forward end is a bevel pinion engaging with a bevel pinion on the axle tree of the bearing wheels, and thus motion is given to the blades. The frame in which they are mounted can be raised by a lever without affecting the fixed blades. To regulate the draught, there are two rods extending to the back of the machine; by one of these the pin connecting the draught bar and draught plate can be raised, and by the other the bar can be drawn from side to side, the pin being allowed to fall back when the required position has been attained.

[Printed, 10d. Drawing.]

A.D. 1858, April 26.—No. 920.

SEAMAN, JOSEPH.—“Apparatus for effecting the working or cultivation of land.”

The apparatus is intended to be drawn by steam or other power. It consists of a frame carrying ploughs or other implements, and mounted on the axle of a pair of running wheels. A short cross-beam is pivotted on this axle, and to either end of this beam is pivotted an arm carrying a set of ploughs in a suitable frame. One arm is turned up out of the way where the apparatus is at work by the cross-beam being tilted on the axle. In addition to this, the depth and angle of the

ploughs can be regulated by adjusting the arm carrying the ploughs and also altering the position of the ploughs themselves in the frame. A second cross-beam on the axle carries at each end a steering wheel which can be directed by a rack and pinion. The hinder wheel for the time being only is used, the other being raised. The set of ploughs out of action is held up by an arm on this cross-beam being connected to the plough frame. The cross-beam which carries the ploughs can also be prevented moving on the axle by a steel "friction strap or break" surrounding a boss or "drum" thereon and secured to the axle. This can be tightened by a screw. The joints by which the arms carrying the ploughs are connected to this beam can be tightened by levers, "which by means of screw spindles passing through and forming the pins of the joints, squeeze the sides or jaws of such joints firmly together." The axle is made telescopic, the joint being secured by a "split ring" and screw.

The apparatus is drawn by an endless rope passing round a driving pulley on the engine and round two pulleys on weighted trucks stationed at opposite sides of the field, and moved for each traverse of the apparatus. The connection to this endless rope is made by means of a short rope, attached to the end of the plough frame in action at the time, and furnished at its other end with a lever clutch, by which it can be attached to, or detached from, the endless rope without stopping the engine.

[Printed, 1s. 2d. Drawings.]

A. D 1858, April 29.—No. 958.

SMITH, WILLIAM. — (*A communication from Pierre Kittingle.*)—"Steam ploughs."

The apparatus consists of a frame mounted on running wheels and supporting a steam engine. At back and in front is a set of plough shares, mounted on a rocking shaft, so that they can be turned up out of the way; the set at the rear being turned up, and those which are in front for the time being employed. A steering wheel is set at each end, both wheels being at the same side of the machine. An endless band works round each running wheel, said band being composed of blocks of wood, &c. jointed together. The band is kept in place by

three rollers, above, in front of, and behind the wheel, and serves as a "portable track." In front of the wheel is a "clearer" or share to cut a furrow for the wheel to run in, and behind is a similar clearer. Both these are connected by rods so that they can be turned up or down, one being up while the other is down. They are formed so that when turned in one direction they act to cut a furrow, when turned in the other to fill up the furrow. The leading share is turned to cut the furrow, and that which follows the wheel to fill it up.

[Printed, *sd.* Drawing.]

A.D. 1858, April 30.—No. 960.

DE LOWENDAL, R. B. HUYGENS.—(*Provisional protection only.*)—Construction and use of springs.

The invention refers to the use of springs with "more than one curvature." These springs are to be used, among other purposes, for "turning agricultural and other implements," but no explanation is given of the manner of their application. The drawing shows several springs, the peculiarity of which appears to be that one or both of their ends are curved in the opposite direction to the curve of the spring.

[Printed, *sd.* Drawing.]

A.D. 1858, April 30.—No. 964.

PEAUCELLIER, BENJAMIN LOUIS AUGUSTE.—Plough.

The greater part of the Specification is occupied with an enumeration of the advantages of the invention. The descriptive part runs as follows:—"All the pieces which compose the plough are iron or cast iron, and it may be described as follows:—It is composed of the body and what may be called tail of the plough which contains four shares. The axle has a vertical support of two uprights meeting at the top by a centre part traversed by a screw for earthing and unearthing the plough. This screw acts on a half circular branch of iron, which supports a cast-iron box. Behind the body are two riving knives and the shares for opening the first furrow." "The special character of this plough consists in it power of turning at the end of the furrow, and to effect this the handles are placed horizontally, and on pulling a spring placed against the body of the plough a half revolu-

"tion is effected. The handles are then placed according to the necessary slope where they are fixed by means of a shaft of iron which unites them." The sketch appended to the Specification shows a double furrow plough with duplicate shares in a reverse position, *i.e.*, on the upper side of the beam. A similar drawing is appended to the Provisional Specification.

[Printed, &c. Drawings.]

A.D. 1858, May 1.—No. 975.

WARDELL, ROBERT.—Reaping machines.

Improvements on No. 904, A.D. 1857.

1. The "endless conical belt," described in that Specification is mounted at its outer side on an endless chain passing over pulleys on rollers set radially from the point of the triangle formed by the belt. Small rollers affixed to the belt also run on a segmental bar outside it. A belt of leather or vulcanised rubber and fabric may be substituted, and that would then be rivetted to the pieces carrying the friction rollers, the chain being dispensed with. This belt would be tightened by "an adjusting piece placed on one end of the shaft or spindle on which the larger or driving pulley is fixed, or by a notched pulley and eyelets in the strap."

2. Antifriction rollers are mounted in the guide bar, and against these the cutter bar works. These rollers may be mounted above and below the cutter bar, and the lower set may be grooved to allow the cutter bar to fit therein.

3. Two rollers are mounted, one above the other, with horizontal axes, to receive the cut crop from the endless belt and deliver it to the discharging rakes. These may be driven by toothed gearing from the driving shaft, or by endless bands. The upper roller is larger than the lower one, and they are driven at equal surface speed.

4. A pair of rakes are pivoted opposite each other in such a position as to form a flat surface with their teeth on which to receive the crop from the rollers last mentioned. They are kept up to their work by a weighted pulley so that when a sufficient amount of corn, &c. has been deposited on them to overbalance the weight, the rakes partly rotate and allow the corn to fall on the ground in a sheaf.

[Printed, &c. Drawings.]



A. D. 1858, May 18.—No. 1104.

**HIXON, WILLIAM JAMES.**—(*Provisional protection only.*)—  
"Reaping and mowing machines."

1. The cutter bar is of a "bent or slightly circular form, so  
"as to suit the rise of the course of the land."

2. Circular cutters are used, and to these either a rotary or  
a reciprocating motion is given by endless bands over pulleys  
on their spindles.

3. At the back of the machine is a "pan or metal frame,"  
into which the cut crop is delivered by a "revolving apron."  
This is intended to "lay the crops" "in a more suitable way  
"for easily gathering them."

4. Cutters as above described may be used with a straight  
bar, as well as with the curved bar, and the bar may have  
movement given it or may be stationary.

[Printed, 4d. No Drawings.]

A. D. 1858, May 26.—No. 1182.

**BAYLISS, WILLIAM.**—"Iron tubular fencing to be used for  
"general fencing, as well as for the purposes of irrigation and  
"conveying water where required for agricultural and horti-  
"cultural purposes."

The top or any other rail of a fence is made tubular, for the  
purpose of conveying water. It is connected to a tank at a  
level higher than the highest point of the rail. The separate  
hurdles forming the fence are connected by suitable tubular  
junction pipes, to which taps can be affixed where required.  
In passing a gate, &c. a pipe is led through the ground under  
the gate, and connected at each side to the main pipe. The  
pipe leading down to the ground may form the bar to which  
the gate is hinged.

[Printed, 3d. Drawing.]

A. D. 1858, May 26.—No. 1184.

**FOURGASSIE, PIERRE ANTOINE.**—(*A communication.*)—  
"Apparatus for clod-crushing, rolling, weeding and scarify-  
"ing, clearing or preparing land."

The apparatus consists of a roller formed of a number of  
separate wheels set loose upon a common axle, which also  
revolves freely in brackets, supporting a frame above to which

the draught pole is attached. The wheels are furnished with curved tines, one or more rows to each wheel. A frame mounted at the back carries a set of straight teeth which pass between the revolving tines to clear them. This frame is hinged so as to yield in a upward direction, and has handles to it by which the action of the clearing teeth can be regulated. When the clearing teeth are not required to be in action, the frame can be turned up out of the way. For transportation from place to place, two bearing wheels may be affixed to the apparatus. For weeding, any of the wheels as required can be removed, the remaining wheels being keyed to the axle-tree to keep them in place. The machine can be drawn in either direction by shifting the draught pole, so that the teeth may act in either direction. The frame may be loaded if required.

[Printed, ed. Drawing.]

A.D. 1858, May 27.—No. 1196.

CLARKE, CHARLES.—"Machinery for dibbling wheat and  
" other grain or seeds and manure."

The dibbles are fixed in one or more rows (preferably two) on the disc of a wheel revolving between fixed side plates in a suitable frame. Each dibble as it leaves the hole made by it is partly revolved by a projection thereon striking against a stop on one of the side plates, and is brought back by a spring. Seed and manure boxes are fitted behind the dibble wheel. In the drawing only the seed distributing apparatus is figured, but as it is stated that there are two receptacles for seed and for manure, each with its own funnel, the apparatus for supplying manure is presumably similar to that for planting the seed. In the latter a wheel with cups thereon is rotated by a crank and connecting rod from the dibble wheel. This delivers the seed to a funnel leading down to the dibble hole. The funnel is closed by a valve with a spring, and the valve is opened by the dibble that has just left the ground striking against an arm on the valve. The apparatus is impelled by handles behind, and is supported on a wheel or wheels behind the dibble wheel.

[Printed, ed. Drawing.]

A.D. 1858, June 1.—No. 1232.

CHANDLER, ROBERT WILSON, and OLIVER, THOMAS.—  
"Agricultural apparatuses for ploughing and otherwise  
"operating upon land."

An apparatus for steam ploughing is described. It consists of a frame mounted (by preference) on three wheels, one at one side, running in one of the furrows, and two on the other, running on the unploughed land. These two are preferably of a peculiar shape, having rounded peripheries with a narrow central rim. The single wheel has the ordinary flat rim. Either of the pair of wheels may be used as a steering wheel, according to the end which is going first. They "work upon short axles, each screwed or otherwise "connected to a spindle which is bent so that its end rises "perpendicularly" and has on it a crank which is acted upon by a lever and connecting rod to turn the wheel and steer the apparatus. The hinder wheel for the time being is fixed by a pin. At each end of the main frame is a frame connected to a transverse rock shaft near the centre of the machine, and carrying on it a set of ploughs which work in opposite directions. These two frames are so connected that when one is lowered to bring its ploughs into action, the other is raised. This may be effected by a pinion between racks at the centre of the apparatus or otherwise. Each frame carries at its end a seat for the attendant. The hauling chains may be attached to rods arranged for the purpose under the frame of the machine, or the chain "is led at each end over a pulley at or "near the extremity of the internal frame, and thence passes "under the machine to the front" in order to hold the ploughs down to the ground. Any prime mover may be used, preferably one described in No. 1495, A.D. 1856, or one with certain hauling arrangements described in the present Specification.

The anchor used is "formed of a bed" which can be loaded as required, and "furnished with cutting and holding blades "below and a winding pulley or drum above, and also with "a ratchet and pawl arrangement, whereby the pulley or "drum may be turned round, and a rope the other end of "which is fixed) be wound upon it, so as to draw the anchor

“ along the headland as required, the blades cutting through  
“ the soil as the anchor advances.”

[Printed, 1s. 10d. Drawings.]

A.D. 1858, June 2.—No. 1236.

LUIS, Jozé.—(*A communication.*)—“ Farming implement  
“ called the gleaner.”

This consists of a rake fitted in a frame mounted on a pair of running wheels. A pair of levers is fitted over the machine and to their front ends chains are attached by which the rake can be raised. The hinder ends of these levers are within reach of the driver, who has a seat at the back. The levers may be loaded, to balance the weight of the rake, &c. The levers are mounted on upright arms terminating in quadrants, which seem to rock on horizontal bars attached to the framework. The rake can be raised entirely from the ground and held up by a chain. The levers when not depressed to raise the rake, rest in a crotch on a vertical stem.

[Printed, 8d. Drawing.]

A.D. 1858, June 2.—No. 1237.

LUIS, Jozé.—(*A communication.*)—(*Provisional protection only.*)—“ New description of plough, with fore carriage applicable to all swing or common ploughs.”

The Provisional Specification gives a very imperfect explanation of this invention. It commences by stating that “ the principal feature of the invention is the fulcrum or fore carriage.” A few lines are then devoted to the supposed advantages of the invention and the document concludes with a short series of references by letters to the drawing. There is no description of the action of the parts. The drawing gives a single representation of a wheel plough, in which the beam is in two parts. The front portion is affixed to the fore carriage, and is jointed to the hinder part, the end of the front part being jointed about the middle of the hinder part, and two parts consequently overlapping considerably. On the front part is an upright which forms the fulcrum of a horizontal lever. The front end of this lever is connected by a chain to the front end of the hinder part of the beam, and the other end of the lever is held by a pin at any desired part of

an upright on the same part of the beam. The object of this is presumably to raise the point of the share, which is fitted to the hinder part of the beam.

[Printed, *ed.* Drawing.]

A.D. 1858, June 5.—No. 1265.

**BANKS, JAMES.**—(*Provisional protection only.*)—Reaping machine.

The following is the whole Provisional Specification :—

"This invention consists in the use of two horizontal disks  
"or wheels with cutting edges formed on or attached to their  
"periphery, and which are secured to the lower ends of  
"parallel vertical driving shafts which are mounted on the  
"front of a suitable carriage, one of the disks being so placed  
"as to overlap a portion of the edge of the other. The two  
"upright shafts with their disks being caused to revolve in  
"an opposite or reverse direction to each other, form endless  
"cutting shears, motion being communicated thereto from the  
"travelling wheels of the machine by means of endless bands  
"or other mechanical equivalent. The propelling power, it  
"is proposed, should consist of two horses yoked side by side  
"at the rear of the machine."

[Printed, *ed.* No Drawings.]

A.D. 1858, June 7.—No. 1277.

**FERRABEE, JAMES.**—"Machinery for cutting, collecting, and  
"spreading grass, and for sweeping."

The Specification deals principally with lawn mowing machines. The only portion which appears to refer to any subject connected with the present series relates to a rotary rake. This is mounted on bearing wheels in the usual manner, and rotated by gearing therefrom. The rake heads can be set nearer to or further from the axle by adjusting arms. The arms are pivotted to discs on the axle, and pass through slotted rings outside the discs. By turning either the discs or the rings, the angle of the arms can be altered, and the heads brought closer in or extended, as required.

[Printed, 1s. 2d. Drawings.]

A.D. 1858, June 7.—No. 1278.

**BOWLEY, JOHN JIMSON.**—"Apparatus for applying lime, soot, and other matters to turnips and other crops, and manure to land."

In a suitable frame mounted on a pair of running wheels there is fitted a hopper for lime, soot, &c., with a discharge funnel leading to the ground. As the lime, &c., leaves the funnel, it is met by a blast from a fan at the front of the machine with a tube leading to the discharge opening of the funnel. The air supply is drawn through a tube reaching to the ground below the fan. The end of this tube is furnished with a curtain which drags over the plants and disturbs the insects thereon. These are drawn up into the fan and discharged among the lime, &c., in order to kill them. Several tubes may be arranged, corresponding to the rows of plants to be treated, or the soot, &c., may be discharged through a broad passage, the breadth of the machine. A curtain is hung over the discharge tube. There is a rotary stirrer in the hopper. When manure is being distributed, the rising pipe for the air supply is omitted.

[Printed, *ed.* Drawing.]

A.D. 1858, June 7.—No. 1281.

**WIMBALL, HENRY.**—"Apparatus for destroying the turnip fly and other injurious insects on growing crops."

A frame with close sides down to the ground and covered in above is mounted on running wheels. In the middle of the frame is a furnace with feeding doors above, and behind and in front of the furnace are fans, arranged, the front one to draw down the smoke, &c., as it leaves the furnace, and direct it on to the ground, the second to drive air into the lower part of the furnace. This latter fan is also meant to drive into the fire any insects that rise off the plants. A hopper to contain sulphur, &c., may be fitted above the furnace, and vibrated in any suitable manner from the running wheels. The shafts for draught are set in front at one side, so that the horse may not disturb the insects in front of the machine. The front of the machine is made sloping inwards, to prevent the insects being knocked off by it. For hops and other tall plants, a hose may be attached to the machine to direct the vapour on to the plants.

[Printed, *ed.* Drawing.]



A. D. 1858, June 9.—No. 1300.

HUGHES, EDWARD THOMAS. — (*A communication from Auguste Alexandre Scabell.*) - "Apparatus for sowing grain."

A cylinder to contain the seed to be sown is mounted on a suitable carriage with a pair of handles by which it can be propelled by a man. Through this cylinder an open vertical pipe passes, projecting at top and bottom. Near the bottom of the cylinder is an opening in the pipe through which the seed passes to the interior thereof. The size of this opening is regulated by a slide over it and by a "piston" sliding in the tube and fitted with a handle passing through the tube to the top. By gearing from the axle of the running wheels the pipe is rotated. The axle also appears to pass through the pipe, and there is a "metal ball" on the axle, "which guides the seeds as it falls through the pipe." It is therefore to be presumed that the lower portion of the pipe is separate from the upper part. This lower portion reaches down near the ground. In front of it is a share for cutting a furrow, and behind it a rake, &c. for covering the seed. Some small modifications in the seed pipe are described which consist mainly in having a portion cut away, instead of there being a hole therein.

A larger machine, to be worked by cattle, may be made by connecting a number of cylinders, &c. on a suitable frame, and driving them from the running axle as before.

[Printed, 10d. Drawings.]

A. D. 1858, June 24.—No. 1431.

CAHOON, CHARLES WILLIAM. — "Machine for sowing seed or fertilizing material or other substances broadcast."

The apparatus may be mounted on a pair of running wheels, or it may be of such a form as to be carried in any suitable cart. At top there is a hopper with a vibrating stirrer therein, and having its discharge opening at bottom fitted with a slide. This delivers into the small end of a funnel set horizontally on a shaft at right angles to the axle-tree and so that its lip projects beyond the back of the frame of the machine. On the shaft carrying this funnel is also a disc which closes the mouth of the funnel, leaving only a small opening round its edge. The

disc being larger than the funnel this opening is at the side, not at the end. The funnel is furnished with "helical" "flanches," on its inner surface, or with transverse plates passing through the central shaft. Rotary motion is communicated to the shaft by suitable means from the running wheels, so that the seed is scattered through the opening at the end of the funnel. A smaller apparatus of similar character may be made to be carried by a man and operated by a winch handle.

[Printed, *6d.* Drawing.]

A.D. 1858, June 25.—No. 1438.

TAYLOR, JOHN.—"Improvement in the construction of horse-  
" hoes, applicable also to drills."

The hoes are mounted "on independent levers which are  
" severally jointed to the forward end of a balance frame," the fulcrum of which is the axle of the running wheels. It is made capable of sliding on this axle. The frame and hoes can be moved from side to side by a steering rod affixed thereto, on which is a segment rack gearing with a fixed rack on the axle-tree. By giving an axial motion to this rod the frame can be moved so as to bring the hoes into suitable positions with regard to the rows of plants, &c. Instead of the rack, any mechanical equivalent may be employed. The hoes can be raised from the ground by means of the steering rod, which acts as a lever for the purpose. To hold the hoes clear off the ground, there is a hook on the tool-box over the frame, to which this rod can be fastened. The axle may be lengthened and shortened by being made in two parts connected by a socket or tube fitting over the opposite ends of the separate parts. Within this socket is a screw, engaging on pins on the axle-tree. Similar arrangements to the above may be applied to drills, no special description being given of the manner of such application.

[Printed, *1sd.* Drawing.]

A.D. 1858, June 26.—No. 1440.

LEMON, THOMAS.—(*Complete Specification but no Letters Patent.*)—"Improved link to Cartwright's original patent  
" chain harrow."

According to the drawing appended to the Specification, the link, instead of being square with rounded corners, has a short projection formed at each corner in the direction of the diagonal of the square.

[Printed, *ad.* Drawing.]

A. D. 1858, June 26.—No. 1443.

WOOFÉ, WILLIAM.—(*Provisional protection only.*)—"Implements for paring, hoeing out, and clearing land, and for depositing seed."

The following is the whole Provisional Specification:—

"My present invention consists in additions to, and improvements on, an implement for which Letters Patent were granted me for Great Britain, the 27th Nov. 1856. In the Specification of my former patent I shew the turn furrow fixed on to the stem by means of a bar rising from the stem. Now for such purposes as raising turnips from the row, it is necessary to remove the turn furrow, and in order that there may be no impediment I remove the bar rising from the stem and connect the turn furrow to the stem by means of a bolt carried from the back of the turnfurrow down through the stem. Thus when the turnfurrow has to be removed there will be no parts to interfere with the proper action of the implement as a parer, or hoer out, or clearer of turnips, and for other like purposes. In order to make my implement act as a drill, I fit on to the axle of the hind wheel, which is prolonged for the purpose, one or more sheaves over which a strap or blind is passed, communicating with a revolving wheel or dropper fixed under a seed hopper placed at the rear of the beam of the implement. For some purposes I fit a revolving pulverizer or harrow, in the shape of a boss with radiating arms or tines, upon the axle of the hind wheel of the implement, the axle being prolonged for its reception. Lastly, I fit a tip of steel upon the share or stem, and make a notch in the turnfurrow at the bottom for its reception."

[Printed, *ad.* No Drawings.]

A. D. 1858, June 26.—No. 1444.

CAMPBELL, DANIEL.—(*Provisional protection only.*)—"Grubbing and harrowing land roller."

The following is the whole Provisional Specification :—

" This invention consists of an agricultural implement calculated to do the work of both grubbing and harrowing in one machine. The machine I propose to employ for this purpose consists of a strong wooden or metal framing, having shafts attached thereto, either for one or more horses, the lower part of the framing being made V-shaped. At the bottom of the framing and between the sides thereof is placed a roller the axes whereof are inserted in the lower part of the framing, revolving therein. On the outer surface of the roller are placed at intervals metal spikes running in a straight line from end to end of the roller; between each row of spikes are placed rows of small spade-shaped pieces about the same length as the spikes. It will appear by the foregoing that as this roller revolves, it has the effect of grubbing and harrowing at the same time as well as saving a great deal of labor in cross ploughing. For the purpose of easy conveyance, a pair of wheels are to be placed on the ends of the roller."

[Printed, &c. No Drawings.]

A. D. 1858, June 28.—No. 1453.

LUIS, Jozk.—(*A communication.*)—(*Provisional protection only.*)—"Machines for reaping corn."

The drawing attached to the Provisional Specification is a mere rough sketch, and the brief explanatory notes which are all that is given in the Specification itself are quite unintelligible. The following description has been made from an inspection of the drawing, but it must not be accepted as anything more than a possible interpretation of the inventor's intention. There are no data for any accurate description. The cutters are of the usual sort, and are reciprocated by an eccentric actuated by an internal spur wheel on the face of the main running wheel. From the shaft of this wheel motion is given to a vibrating lever, which is joined by a connecting rod to a short arm projecting from a long lever pivotted to the top of an upright at the side of the machine behind the running wheel. The long lever and short arm forms in fact a bell-crank lever. The long lever is thus caused to vibrate in a plane across the line of the machine's onward progress. Its lower end is connected to a frame carrying teeth projecting

up through slots in the platform and these are thus caused to traverse to and fro across the platform. Stops are arranged to depress the teeth for the backward traverse and raise them for the forward one, so that they may pass under the corn on the platform as they move back, and rise and carry it to the side as they move forward. An additional board may be fitted to the platform when the corn is high. There is a gathering reel of the usual character.

[Printed, col. Drawing.]

A. D. 1858, June 30.—No. 1469.

BARRAT, PIERRE PHILIPPE CELESTIN and BARRAT, JEAN BAPTISTE. "Machinery for digging, reaping, mowing and performing certain agricultural operations, and for cutting drains and excavating."

The specification describes with considerable minuteness an apparatus carrying a steam engine, and fitted with spades and other tools for operating on the soil. It is stated that the apparatus is also available for reaping and mowing, but no description is given of the manner of such application.

It is preferred to use a single steam cylinder, but two may be employed. Motion is communicated to an intermediate driving shaft, whence the bearing wheels are driven, and also cranks carrying the tools. The tools may be supported on a frame which can be raised and lowered by screws, &c. "The tools may be caused to act twice or oftener for every revolution of the driving shaft by means of an intermediate toothed wheel" "gearing with a pinion on the driving shaft and carrying a stud, which at every revolution moves a wheel on the propelling wheels' axle one tooth." This arrangement may be employed or not, so as to obtain either continuous or intermittent action. "For throwing parts into and out of action, a rod travelling in guide tubes may be actuated by levers engaging and disengaging a clutch mounted on tubes, on which are the shafts' bearings, a chain wheel being at one end, and a fly and a chain wheel at the other." "The driving shaft cranks may be thrown in and out of gear, through the fly wheel, by moving studs into and out of slots in the crank." "The forks, spades, picks, or other tools used may have alternating, continuous, intermittent, &c. motion, and are jointed or otherwise connected to cranks or

“ shanks, or to a tool carrier, and may be placed in single or  
 “ in double rows, the front shorter than the back, with a space  
 “ between exceeding the thickness of the earth to be broken,  
 “ so that the layer detached by the front row will fall over  
 “ when drawn back, and divide the earth into two layers.  
 “ Tools acting by pressure may be so mounted, that the back  
 “ row may finish cutting when the front begins.” For open-  
 ing trenches, a tool is employed “consisting of a curved or  
 “ concave rod ending in a pick, the inclined edges of which  
 “ form two sides of a triangle, while the prongs carry two  
 “ plates meeting at an angle, forming a shovel.” Jointed or  
 “ hinged tools may be used to allow resilience on the shanks.  
 “ A curved tray may receive the earth thrown up, trailing on  
 “ the ground,” or an endless web may be used, delivering the  
 earth at the side or elsewhere. The tools may have a “twofold  
 “ motion” from cranks and rocking levers. Cranks may also  
 be so arranged, as to communicate to the tools a variety of  
 different movements as required. The tools may be set “angu-  
 “ larly to each other,” or “obliquely to the axis” so as to  
 collect earth from the sides towards the centre. This is for  
 forming ridges.

The apparatus may also be arranged to be worked by horse  
 power, motion being communicated to the different parts from  
 the bearing wheels.

[Printed, 1s. 8d. Drawings.]

A. D. 1858, July 14.—No. 1591.

FOWLER, JOHN, junior.—“Apparatus used when ploughing,  
 “ tilling, or cultivating land by steam power.”

The first part of the invention relates to engines and wind-  
 ing drums.

The second part relates to a method of taking up the slack  
 of the traction rope, when an endless rope is used. The ends  
 are attached to drums on the implement frame. The shafts of  
 these drums are geared to shafts having each two pulleys, one  
 smaller than the other, and each connected to the shaft through  
 a ratchet. Each small pulley is connected by a strap with the  
 opposite large pulley. On starting, the rope revolves the drum  
 on which it is wound, this sets in motion the large pulley,  
 which drives the opposite small pulley at a greater speed, and



thus causes the second drum to revolve at a greater speed than the first, and so to wind up the other end of the endless rope. When all the slack is thus taken up, the brake is put on, and the drum prevented from revolving further.

[Printed, 2s. 6d. Drawings.]

A.D. 1858, July 19.—No. 1622.

**SMITH, HENRY.**—"Manufacture of harrows."

The bars of the frame are connected by hollow rivets. The rivet is placed through the holes in the bars, a washer is placed thereon, and it is then rivetted down. The holes in the rivets are taper, the tines are also taper, and they are dropped into the holes of the rivets and hammered tight. A cotter may also be used to secure the tine still further. The tines can be removed for transport or repair by driving them up with a hammer, a tool of suitable shape being placed over the points to protect them from injury.

[Printed, 6d. Drawing.]

A.D. 1858, August 12.—No. 1843.

**SMITH, HENRY, and ASHBY, THOMAS WOODHOUSE.**—Hay-making machines.

1. A method of obtaining reverse motion for the tine cylinders is described. It consists in causing the motion of the bearing wheels to be communicated to the tine cylinders either directly or through an intervening pinion. The tine cylinder axle has its bearings in a rocking plate actuated by a lever, and when this plate is rocked, the pinion on the axle is raised out of gear with the spur wheel on the axle of the running wheel which drives it. By the same action a pinion on the plate which is permanently in gear with the first pinion is brought into gear with the spur wheel and thus drives the pinion and tine cylinders in the other direction. Also the plate may be made to rock on the tine cylinder axle-tree as a centre, and then there is a hollow axle over the same on which the tine cylinders are mounted, the ends of this hollow axle being connected to rocking frames at each side so that the action may be simultaneous at both ends. In this case the cylinders are driven through either one or two pinions, in the same manner as before.

2. The second part "relates to the application to the teeth  
" of haymaking machines of moveable bars provided with  
" sharp cutting edges, and also short teeth or tines for the  
" purpose of extending the use of the implement, and enabling  
it to cut off the tops of thistles or weeds, and also of breaking  
" up light clods of earth or manure." The bars have holes  
which fit over the tines, and they are secured to the tine bars  
by brackets screwed thereto. They may or may not have  
teeth thereon, which alternate between the fixed teeth, and are  
of such a length that their points are even with the points  
of the fixed teeth. The bars may be fitted at any height on  
the fixed teeth when they are used without the additional  
teeth.

[Printed, 1s. 3d. Drawings.]

A.D. 1858, August 19.—No. 1887.

PADWICK, WILLIAM FREDERICK.—"Implement to be em-  
" ployed on land sown with turnips to protect them from  
" the ravages of the fly, applicable also to the protection of  
" other crops."

A suitable carriage with a pair of running wheels has  
mounted thereon near the front a cylindrical reservoir to hold  
water or other liquid, with a nozzle at bottom. A syphon  
tube is fitted to reach to the bottom of this reservoir, and  
deliver into a horizontal pipe fitted with taps under which  
is a sieve to distribute the water over the plants. A supply  
pipe is also fitted to the reservoir. Behind the reservoir is a  
hopper for ashes, dust, grit, soot, lime or other material  
to be distributed over the plants. In this is a revolving stirrer  
and a number of vibrating scrapers. At the back are openings  
closed by slides, and through these the dust, &c. falls into  
sieves which receive a jogging motion from a "joggler" of  
" three or more rods revolving on one centre." The apparatus  
may be worked from the running wheels or by a handle.  
A hose for distributing liquid manure may be attached to the  
nozzle under the reservoir. Or instead of the syphon tube,  
a hose may be attached to the joint at the top of the reservoir,  
and the apparatus used as a fire engine.

[Printed, 10d. Drawing.]

A. D. 1858, August 28. — No. 1953.

COODE, GEORGE. — (*Provisional protection only.*) — Hose for distributing liquid manure, &c.

1. Method of uniting the "coiled hose" described in the Specification of No. 12,093, A. D. 1848, to the distributor. This is effected by means of a "bayonet or other moveable joint."

2. In hose to be coiled on drums, such as are used in the inventor's "apparatus for delivering manure in a liquid state over fields" "the inner should be smaller than the outer circumference of the hose." To ensure this being so, the edges of the material to be joined to form the "inner or concave side," are placed "upon points rising from a frame composed of a series of laths or scutcheons united crosswise, but in such manner that each lath shall be free to move radially." Guides on the bottom of this frame travel round a fixed plate of the curvature required. "While travelling round this curve, the edges may be united by sewing."

[Printed, 4d. No Drawings.]

A. D. 1858, September 3. — No. 1999.

HARKES, WILLIAM. — "Plough and pulverizer."

"The improvement consists in arranging" "a series of cutters supported in a circular frame directly behind the ploughshare, and at right angles to it, so that as the soil leaves the ploughshare, it is delivered on to the knives, cutters or pulverizers, which are caused to revolve rapidly by means of suitable gearing in connexion with the supporting wheels of the plough, so that as the plough progresses, the knives rotate and cut or pulverize the earth as required. The apparatus may also be employed for digging up potatoes, &c. for which purpose a series of forks may be substituted for the knives." The knives are described as "every alternate knife being double or fork-like, and all supplied with cutting edges." There is "an extra wheel placed on the left-hand side of the plough to assist in turning it." The ploughshare is "furnished with lugs, so that when required a 'mould board' may be attached and the plough may be used without the pulverizer."

[Printed, 6d. Drawing.]

A.D. 1858, September 23.—No. 2136.

DUNDONALD, THOMAS, Earl of.—(*Provisional protection only.*)—"Apparatus for tilling and preparing land for cultivation."

Spades or other implements are mounted on a shaft caused to revolve in the same direction as, but at a greater speed than, the bearing wheels of the frame in which the whole is mounted. The digging shaft is driven by spur gearing, endless bands or other suitable means.

[Printed, 6d. Drawing.]

A.D. 1858, September 25.—No. 2153.

ROMAINE, ROBERT.—"Steam cultivators."

Some of the improvements are applicable to agricultural steam engines generally, and some others to the engine and driving apparatus of the steam digger described. This is an improvement on the apparatus described in former Specifications of the inventor. To improve the steering, certain alterations are made in the position of the cylinders, &c., the crank shaft being placed between the driving and steering wheels. The "digging frame" is lengthened, and it has "for its fulcrum the advanced crank shaft." To prevent the wheels slipping, "an arrangement of rotary spades or picks" is mounted so that "they will form an abutment for stud pins or bolts projecting laterally from the rim of the wheels" or from the sides of the endless railway where one is used. To facilitate turning, a "portable turntable" is used, of two circular plates with or without antifriction rollers between. An "adjustable dead weight" is used to raise the digging cylinders. The inventor proposes to "simplify the steering apparatus by dispensing with the self-acting clutches and springs on the upright spindles of the front wheels by providing sliding bearings for the transverse shaft that carries the two worms, and throwing it and the two worms out of contact with the worm wheels, thus relieving the steering wheels from any controlled action in turning round."

[Printed, 1s. 8d. Drawings.]

AGRICULTURE.

A.D. 1858, September 25. —No. 2156.

HALL, COLLINSON.—"Apparatus for applying power to the cultivation of the soil."

1. Improvements in the arrangement of winding drums.
2. A method of turning ploughs, &c. at the headlands. The implement is fitted with "a small sole piece or turntable, upon which the rear wheel runs on reaching the headland, and then is supported by it and turns upon it."
3. The implement is connected to the traction rope by an apparatus which detaches itself automatically. It has attached to it by a chain a small frame which grips the rope between two blocks forced together by a bent lever. The end of the lever strikes against a fixed ring near the headland, and the rope is allowed to run free. The end of the lever bears on a small metal piece fitted in one of the gripping blocks, and this piece is moveable, so that the lever may be set on either side according as the draught is in one or the other direction.

[Printed, 8d. Drawing.]

A.D. 1858, September 28.—No. 2165.

THOMPSON, EDWIN, and LAZENBY, WILLIAM, executors of BENJAMIN JONES.—"Press-wheel rollers or clod-crushers."

These are formed of longitudinal bars carried by discs forming the ends of the rollers. On the axle of the roller, and within it, a pair of arms are mounted, and these support a fluted roller which rests on the internal periphery of the large roller, the flutes passing between the parallel bars to clear them from earth, &c. As the main roller revolves, the small inner roller runs over its internal surface. To allow the small roller to rise and fall it is mounted in slots in the supporting arms.

[Printed, 10d. Drawings.]

A.D. 1858, October 2.—No. 2193.

OWEN, LEMUEL DOW.—(*A communication.*)—(*Provisional protection only.*)—"Ploughs for digging up potatoes and for other purposes."

The following is the whole Provisional Specification:—

"The improvements consist in having the support or standard of the beam of the plough shaped so as to form a

“ coulter with a pointed or other conveniently shaped foot,  
“ and on or to the point or front part of such foot the share  
“ is fixed by screws or other convenient means, and on or to  
“ the back part of the foot which usually forms the mould  
“ plate or board, prongs or arms are fixed or placed in a kind  
“ of conical form at a convenient distance apart; the centre  
“ prong or arm or that which is the top from the ground is  
“ supported by or on a projection on the standard, made or  
“ cast thereon for the purpose, and is fastened to the standard  
“ or to the mould or frame plate as may be desired. In some  
“ cases I have rollers conveniently fixed under or at the end  
“ of the prongs or arms to remove the mould which may  
“ accumulate on the prongs or arms or mould plate, and in  
“ some cases I have an additional coulter placed in front or  
“ in advance of the standard; and in some cases also I have  
“ an additional share placed above or in advance of that pre-  
“ viously mentioned to act more conveniently on the surface  
“ of the ground. In some cases I have the share, mould  
“ plate, and prongs cast in one piece; the standard and other  
“ parts may be of wrought iron or other suitable metal or  
“ material. The ploughs constructed according to the prin-  
“ ciple of this invention will be found of great advantage in  
“ digging up potatoes, but they may also be used for turning  
“ over or breaking up ground. These improvements may be  
“ applied to wheel and swing ploughs.”

[Printed, 4d. No Drawings.]

A.D. 1858, October 8.—No. 2241.

MUNN, WILLIAM AUGUSTUS.—“Horse hoes,”

The apparatus consists of a frame mounted on a pair of running wheels which communicate motion to two or more inclined spindles. On the ends of these spindles are revolving blades, which act in a plane across the direction of movement to thin out the crop. On the spindles in front of the knives brushes are fixed, which brush the insects from the plants. Behind the knives are rollers, to crush the insects brushed off by the brushes, and behind these again are fixed hoes, which act on the ground between the rows, and also serve to bury the insects. The spindles carrying the brushes, &c. are fitted in front with a universal joint, and behind cords are attached to them by which they can be drawn up out of work. The



rollers can also be raised by chains. For transport, the hinder part of the frame, carrying the fixed hoes and the rollers, can be detached and placed on the front part, the brushes and rotating hoes being raised by their cords.

[Printed, 10d. Drawing.]

A.D. 1858, October 11.—No. 2261.

HANCOCK, JAMES LAMB, and HANCOCK, FREDERICK LAMB.

—"Implements for tilling, breaking up or pulverizing land  
" for sowing seeds, and for thinning out turnips and other  
" crops."

1. An ordinary plough beam has mounted on it a set of stems carrying "knives or cutters" consisting, as figured in the drawing, of horizontal blades with their front edges at an angle to the central line of the implement. The knives are set each at a slightly increased depth to the one preceding it. The front edges of the stems are formed with sharp cutting edges. The knife is fitted to a foot at the bottom. Behind the knives is a mould board, secured to the beam or to the hindermost stem. A disc coulter may be mounted in front of the knives. Vertical knives may also be fitted to the implement.

2. A frame carrying a diagonal bar fitted with knives is mounted on wheels. This may be used for breaking up the soil or for hoeing between rows of plants.

3. Seed drilling machines are made with triple sets of distributors and coulters set so as to sow the seed in three adjacent lines. Each coulter, &c. is set a little beside and behind the next one.

4. For thinning out turnips, &c. a suitable frame carries a transverse shaft on which are rotating discs with cutting edges. Between every alternate pair is a fixed knife, carried by the hind bar of the frame. Handles are fitted to the frame for the purpose of raising it, &c.

[Printed, 10d. Drawing.]

A.D. 1858, October 13.—No. 2279.

PARKER, HENRY.—"Apparatus for the cultivation of land  
" and other agricultural operations."

An engine is mounted on a suitable frame supported on two sets of rollers, one in front and the other behind. The

hindmost set run loose on their axle, all except the outermost rollers, and are fitted with tines which act on the ground. The two outer rollers are plain and are driven from the engine, preferably by pinions engaging with spur-wheels on the rollers. The foremost set of rollers is used to guide the machine, and for this purpose they are fitted to an upright stem with a worm wheel thereon, by means of which it can be turned from side to side. This stem rests on a helical spring surrounding it and bearing against the frame of the machine and a boss on the stem which can be screwed up and down thereon to raise or lower the front part of the machine. Another method of steering may also be employed. The fore rollers are mounted in a locking carriage. Motion is given from the engine to a transverse shaft over the rollers. On this are three sets of bevel pinions, imparting motion in one or other direction to three vertical shafts below. The central vertical shaft gives motion to the rollers; those at the sides have on them pinions gearing with a horizontal spur wheel on the top of the locking carriage. The direction of motion is governed by clutch levers in the usual way. There is also a hand wheel which drives a pinion engaging in the horizontal spur wheel. For moving from place to place large additional "traveling fellos" are fitted over the front bearing rollers, and the tines are removed, unless the fellos are of sufficient size to enable them to clear the ground. The tines may be fitted in the rollers in various ways; they have heads on them fitting in T or other shaped slots in the rollers and secured by wedges. A "complete double cylinder engine" may be fitted on each side of the apparatus, so that the bearing rollers may be driven separately. The machine may be employed to drag barrows or other implements, these being attached behind it. It may also be employed (with suitable alterations) as a roller, a traction engine, or an engine for driving various machinery.

[Printed, 1s. 4d. Drawings.]

A.D. 1858, October 16.—No. 2308.

MARCUS, LAURENT.—Reaping machine.

There are no special improvements claimed in the cutting apparatus, except that the cutting frame should be long enough to clear a passage for the next traverse of the apparatus. The cutters are "triangle shaped" and are carried by a recipro-

eating bar driven in the usual way. The principal improvement is in the construction of the "gathering rack" [(?) rake]. The description of this is not easy to follow. From the drawings it appears that a rake is mounted in a small frame at the angle of a quadrant shaped platform. On this frame is a shaft rotated from the running wheel, and this shaft carries on it a pinion engaging with a fixed segment rack. This rack is double, having teeth on its upper and under surfaces, also at its ends which are rounded so that the pinion may pass from the upper set of teeth to the teeth below. The pinion continuously revolving in the same direction is thus carried round and round this sort of endless rack, and so the frame and rake receive a to-and-fro motion, the rake being also raised or lowered as the pinion is above or below the rack. The teeth of the rake are turned alternately up and down by a stop on its stem. Such at least appears to be the intention of the apparatus.

[Printed, 1s. Drawings.]

A.D. 1858, October 22.—No. 2365.

CLAY, CHARLES.—"Apparatus for harrowing, scarifying and "cultivating land."

The tines, &c. are secured by having the stem of the tine bent round three sides of the bar and a split or other key wedged across so as to pass through the end of the tine and across the fourth side of the bar. The implement may consist of several separate harrows fixed together by hooks at back and front and chains at the sides. It may be formed of two frames, one carrying the tines and pivotted in front to the other on which the wheels are mounted. To raise and lower the tines the frame carrying them is fitted behind with a lever which "works through a guide and is held in position by a "projecting stop or notch on the guide into which it springs "when brought opposite to it; this stop is secured to the "guide by bolts," &c. "in such a manner that it may be "moved up or down the guide." "Similar moveable stops" may be used in "implements having tine bars which rotate" as described in No. 2803, A.D. 1857. When the two frames are used such rotating bars may be employed. The wheels in all the implements are carried by standards fitted in sockets and held by set screws. Sometimes the coupling hooks are kept in

the line of draught. The coupling hooks along the front of the implement are connected together by a rod which keeps them parallel. Castor wheels may be used to support the back part of the implement instead of ordinary wheels. Coupling hooks are attached to the sides, so that the implement can be drawn sideways when required. Shafts may be fitted to the implement, and the front wheels may be dispensed with, the weight resting on the horse.

[Printed, 1s. 4d. Drawings.]

A.D. 1858, October 29.—No. 2420.

CHANDLER, ROBERT WILSON, and OLIVER, THOMAS.—  
"Agricultural apparatuses for ploughing and otherwise  
"operating upon land."

Partly improvements on No. 1232, A.D. 1858.

1. There are "two wheels at the middle of the plough, and, where necessary, one at each end also, in place of the" three, four or more wheels "used in the previous invention. These two wheels are "connected by suitable rods, and are "provided with steering levers extending towards the seats" in such manner that both wheels are turned simultaneously "by either of the steering levers" as convenient. "The sets of ploughs are balanced in a similar manner" to that employed in the previous invention and they are raised and lowered as before. "When racks are used, the rack boxes are "supported by the axles of the wheels, and are provided "below with set screws to adjust the depth." The earth may be thrown to either side as preferred. The implement figured in the drawing has two opposite sets of ploughs. It is mounted on a single pair of wheels at the middle and has small wheels adjustable in height at each end. For steering, the standard of each wheel has on it a crank connected to a lever carried back to the ploughman's seat at each end, the two ends being exactly similar. Both beams are connected by levers to a central transverse shaft, to which is also fixed a double lever extending to either end of the implement. By raising or depressing either end of this, one set of ploughs is raised and the other lowered. A second similar lever carries a wheel running on the ground, so that it is caused to regulate the depth at which the ploughs work according to inequalities in the ground. A slip or disengaging hook may be used to connect the short rope

fixed to the apparatus to the traction rope, and this may be opened by "any suitable obstacle placed on the snatch block" or elsewhere on the arrival of the implement at the head-land." Instead of ploughs, scarifying implements with any suitable tines may be employed, and then "supplementary" "tine beams" may be fitted to the sides of the apparatus to increase its breadth. These beams may be disconnected and formed into a separate small implement. For driving this or the larger implement, the traction rope may be fixed to opposite sides of a "quadrant centred upon a spindle" so that the slack rope is carried out to the side.

2. A "scrath or loose cutting wheel" is fitted in front of each plough to sever roots, &c.

3. Ploughs are connected to either end of a traction or locomotive engine, "connecting them by rods" and raising and "lowering their inner ends by means of racks as before." The wheels of the locomotive engine must in this case be so fitted that they may be locked and steered in pairs essentially "as explained" with reference to the ploughs. The object of this is to plough "directly by a locomotive" or to use it for driving implements by ropes as usual.

4. The draught ropes are connected to a "nearly vertical" lever depending from a transverse stay on the lower part of the machine at the middle for the purpose of drawing the ploughs down well into the ground."

5. This head refers to "forming double snatch and other" blocks with pulleys which may be shifted from one position "to another in the blocks" according to the direction required for the ropes. Such blocks may be mounted in a frame forming a sort of waggon for conveying parts of the apparatus, or attached to the engine. The waggon figured has two pulleys fixed thereon, which can be used when the waggon is in any required position or detached therefrom. The axles are hollow and may be used as "porters" for the rope, either connected to or detached from the body of the waggon. Friction pulleys are fitted at the ends of the hollow axles. When the pulleys are fitted on the engine, they are placed to guide the rope from the drum, and have a reciprocating motion from the engine.

6. The drums of agricultural engines are placed "between" the wheels."

[Printed, 2s. 6d. Drawings.]

A. D. 1858, October 29.—No. 2424.

**DRUMMOND, JAMES.**—"Reaping and mowing machines."

The machine consists of a frame mounted on a pair of bearing wheels. The cutting apparatus projects from this frame, sloping backwards at an angle of 45° from the side. The cutter consists of triangular blades reciprocating through slots in the fingers. It is driven by a crank on a vertical shaft actuated by bevel gearing from one of the bearing wheels. The reel is carried by a frame approximately parallel with the cutters. The cutter-bar and finger-bar are supported by rods extending under the frame and secured by screws, by which the bars can be raised or lowered. The platform is supported by adjusting bars fixed at either side thereto and to the frame at the side, so that it can be raised or lowered. At the "outer extremity" of the platform are fitted "two outwardly sliding arms," the ends of which are curved so as to retain the crop therein. The corn is removed from these arms as it accumulates into sheaves.

[Printed, 10d. Drawing.]

A. D. 1858, November 3.—No. 2458.

**FWLER, JOHN, junior, BURTON, ROBERT, and GREIG, DAVID.**—"Applying motive power to actuate ploughs and other agricultural implements."

Part of the invention refers to a method of turning the implements. For this purpose the traction rope is attached at the back of the frame and led round guides outside the frame to the front, where it is held by a clutch. When the implement arrives at the end of its traverse, the rope is released from its clutch, and the steering wheels turned round; the drag of the rope then causes the implement to turn round, at the same time winding the return rope over the guides on the opposite side. This is then placed in the clutch and is ready to become the traction rope. Instead of the above arrangement, the rope may be connected to one of the front corners. When released from the clutch it then turns the implement partly round, the rest of the turn being accomplished by the return rope.

At the same time the tines may be raised from the ground by one of several methods. The draught rope may be wound



on a drum held by a catch on releasing which the drum is revolved and winds up a chain which raises the tines. The tines may be lowered by releasing the chain, or taking up the rope again on the drum. Or the same may be effected by a rack and a pinion which can be thrown in and out of gear with the running wheels. This last arrangement is stated to be Provisionally protected under No. 216, A.D. 1859.

Improvements in portable engines are also described.

[Printed, 1s. 4d. Drawings.]

A.D. 1858, November 8.—No. 2498.

SMITH, WILLIAM. —“Apparatus for supporting the hauling ropes when hauling ploughs and other agricultural implements by steam power.”

The pulley frames for this purpose are constructed so as to be readily taken to pieces and put together. Two sorts of frames are described.

1. Two short planks have sockets in them to receive each an upright standard. The pulley is mounted on a cross-bar carried by the two standards.

2. The base plate consists of a T-shaped plank strengthened by an iron segment. This is secured to the ground by a spike. On it is a standard with a pin on which the pulley runs. This sort is intended to be used in the line of travel of the implement.

[Printed, 6d. Drawings.]

A.D. 1858, November 9.—No. 2503.

DAWES, JOHN SAMUEL. —“Machine to be used for cultivating land.”

One or more frames carrying rows of tines are set in a suitable supporting frame on wheels. They are so mounted on cranks that by revolution of the crank shafts an up-and-down movement is given to the frames and tines, while the former are always kept parallel to the ground surface. The implement is preferably attached at the back of a traction engine which draws it over the ground and at the same time imparts motion to the crank-shafts. The tines or blades may be of any suitable shape, and the implement may be used “as a hoe, a skim, a turf or peat cutter,” &c. “A drill may be conveniently attached to the machine preceded by a revolving

" harrow, and followed by a light roll." "When broad cutters or diggers are required, it is convenient to turn such cutters or diggers on leaving the ground" which is to be effected by means of a "crank motion."

A method of working an agricultural engine by compressed air is given.

[Printed, &c. Drawing.]

A.D. 1858, November 17.—No. 2591.

**BRENNAND, JOHN.**—"Improvement in ploughs and in other agricultural implements, and in the method of driving the same."

The improvement consists in the application of an "archimedian screw or screws" to a plough or other implement, in order to assist its progress. These screws "may be made to act in place of ploughs by forming their blades of a number of 'shares.'" "The plough and auxiliary screws are to be driven by a combination of animal and steam power, as described in the Specification" of No. 2569, A.D. 1858, or otherwise. The drawing shows a locomotive engine with a pair of these screws on parallel shafts set longitudinally at the back of the engine. The screws are formed of rounded shares set helically on the shaft; they are driven in opposite directions, and one is set further back on its shaft than the other, so as to work behind it. No other ploughing apparatus than the screws appears to be connected to the engine.

[Printed, &c. Drawing.]

A.D. 1858, November 18.—No. 2607.

**STOTEN, DANIEL.**—(*Provisional protection only.*)—"Plough-shares."

The following is the whole Provisional Specification:—

"My invention of improvements in ploughshares consists in the application of hardened steel to the points thereof, so that a hard and enduring surface is presented at the sole or under part of the shares at the point, whereby they are prevented wearing and acquiring a tendency to rise out of the ground. For this purpose I prefer to form the share with a small cylindrical or tapered channel from the point two or three inches backwards. In this channel I insert a hardened

" steel pin, which forms the point of the share and presents  
 " the hard surface required to the soil passed over. When  
 " any wear takes place on this pin it can readily be knocked  
 " out and turned partially round so as to present a new point  
 " for wear. Instead of a steel pin a small piece of steel may be  
 " welded on to the under side of the points of the shares, or it  
 " may be on the under side of small shifting points applied to  
 " the shares of ploughs."

[Printed, *Ad* No Drawings.]

A. D. 1858, November 20. --No. 2635.

ELLIS, HENRY. -- "Apparatus for cultivating, cleaning, and  
 " pulverising land."

A spiked roller is fitted in a frame mounted on the axle of a pair of running wheels so as to rock thereon. The hinder part of this frame is suspended by chains from an overhead roller, fitted in a suitable frame, so that by winding up the chains, the spiked roller can be raised or lowered. A spur-wheel on the spiked roller gears with a wheel on the main axle, so that the roller is revolved in the opposite direction to the running wheels. Shafts, or appliances for steam traction are fitted to the apparatus. The running wheels have spikes on them to increase the bite of the wheels. For traversing common roads these can be removed.

[Printed, *Ad* Drawing.]

A. D. 1858, December 1. --No. 2748.

NEWINGTON, SAMUEL. -- "Agricultural implements."

A frame is made to carry a variety of implements. It has a beam like that of a plough, the fore part of which is bent upwards and carries an adjustable standard with a wheel. Handles are affixed behind. At each side near the centre a side bar is hinged, so that the other ends of the bar can be brought close to the central beam or extended sideways therefrom. When extended they are held in position by quadrants passing through a slot in the beam. Tines of any required shape may be fitted by screws and nuts to the beam and side bars. A "subsoil plough or deep sturter" can be affixed to the central beam in a similar way. This "consists of a coulter  
 " in front and shank behind and of a flat iron sole shoe termi-

"nating in a lengthened dipping double feathered share." At the same time "loes or curved knives" may be fitted on the side arms. "The subsoil plough may also be formed into "a double mould board plough by means of a pin passing through loops on the back of the coulter and on the front of the mould board or otherwise so that the mould boards "may turn as on a hinge." The back parts of the mould boards are attached to the side bars, and thus the boards can be set at any angle. The subsoil plough may also be made into an "expanding broad share or paring plough by attaching to the sole shoe of the subsoil plough a little behind the coulter two steel blades or cutters by means of a screw bolt and nut, so that the blades may turn in the bolt as on a hinge." The other ends of the blades are fixed to the sole plate by bars which can be clamped tight by a nut. "When the nut is screwed up tight the cutting edges of the blades are rendered hollow" so that "the only parts that ride upon the ground are the cutting edges of the blades and the front part of the dipping share." A manure distributor and seed drill may be attached to the frame. A hopper has an endless chain passing through an opening in its floor, the chain being supported by suitable pulleys above and below the floor. This carries the manure through the opening, which is of regulated size. For guano, "which is very sticky," a whale-bone brush is fitted to clear the chain; "to give a vibrating motion to the apron on which the manure falls," a rose-wheel is arranged to give a jogging motion to a bar attached to the apron. For sowing corn, a perforated leather band with a fixed brush is used. For sowing turnip seed, there is "a little circular box on one side of the lower pinion" or pulley, "from which the seed is dropped by any suitable means." The manure or seed may be deposited at intervals by means of two boards placed beneath the outlets from the hopper, "one of the boards being moved to and from the other board at intervals." Coulters may be fitted to the manure distributor.

[Printed, &c. Drawing.]

A.D. 1858, December 4.—No. 2784.

NEWTON, WILLIAM EDWARD. — (*A communication.*) —  
"Grain and grass harvesting machines."

A spur wheel on the axle of the principal bearing wheel drives a pinion on a shaft on which is a drum. This drum is deeply grooved, the groove being so formed as to act as a cam and give a vibrating motion to a lever pivotted in front thereof. Motion is communicated from this lever to the cutter. The groove divides the drum into two parts, one of which slides on the shaft, and is adjustable by means of a screw, so as to fit a roller on the end of the lever, and be tightened up as the surfaces wear. Both parts of the drum may be thus adjustable.

The fingers are of the usual construction with a "cap," but both the body of the finger and the cap are slotted, the edges of the slot being formed into cutting edges. The object of this is to prevent clogging.

[Printed, 8d. Drawing.]

A. D. 1858, December 8.—No. 2789.

NICOLL, BENJAMIN. — (*Provisional protection only.*) —  
"Agricultural machinery."

"This invention consists of a strong framework running on wheels, and moved by horse or other power, having a row of cutters of a peculiar new form, each cutter working on a joint; attached to the framework are endless canvasses which by a mechanical contrivance convey the crops at the time of cutting to any position required. For haymaking the centre endless canvass is raised sufficiently high behind for a row of forks to be placed at the back to receive the crop from the canvass, and to shake and toss the same before its deposit on the ground; below the forks are shifting guides, which leave the crop in one or more rows. Attached to the front of the machine is a revolving rake for the purpose of placing the crop upon the canvass for tossing, &c. as often as necessary; for carrying the hay a platform on wheels is added for receiving from the canvasses sufficient to deposit in large heaps; the machine is made available for ricking by attaching to the wheels endless bands."

Improvements are also described in chaff-cutters, root cutters, and thrashing machines.

[Printed, 4d. No Drawings.]

A.D. 1858, December 9.—No. 2828.

WILSON, JOHN.—“Machinery for tilling and cultivating  
“land.”

“For these purposes a chain or rope is employed which has  
“an anchor” “at each end, so as to hold the same fast at or  
“near the headland.” A carriage, to which the ploughs, &c.  
are attached, has on it an engine and boiler, also a winding  
drum driven by the engine. “The chain used is conducted  
“partly around the chain wheel by suitable guide wheels, so  
“that as the chain wheel is caused to rotate, it will, on the  
“carriage passing from one headland to the other, progressively  
“pick up and again deposit the chain, and the end of the chain  
“from which the carriage is for the time being moving will  
“have its anchor” “moved, so that in the next bout the  
“carriage and implements will act on a fresh portion of the  
“land; or in place of a chain and chain wheel, a rope and  
“pulley or drum may be employed.” To avoid the necessity  
for turning at the headlands, it is preferred to use two sets  
of ploughs, &c., one set being attached at each end of the  
carriage, and provision being made for raising and lowering  
them alternately.

The drawings are occupied exclusively with details of the  
engine.

[Printed, 1s. 2d. Drawings.]

A.D. 1858, December 15.—No. 2875.

CLARK, WILLIAM.—(*A communication from Louis Jacques  
Château.*)—“Agricultural implements.”

The implement described is intended to break up the sub-  
soil, after the passage of a plough, “without mixing the earth  
“of the subsoil with the upper layer of arable ground.” A  
set of tines or coulter is arranged on a suitable block or bar,  
which may or may not have small wheels running on the  
ground. This block or bar is connected by a rod, forked or  
angle, to the axle of a pair of running wheels fitted on a  
suitable frame. It can be raised by a cord on a drum. In  
front of the carriage is a hopper for lime, under which is a  
shelf which has a jogging motion from a cam. There is a  
ratchet and pawl by which the main axle can be thrown out of  
gear with this cam shaft.

[Printed, 10d. Drawings.]



A. D. 1858, December 27.—No. 2904.

HORNSBY, RICHARD, junior.—“Ploughing and tilling land  
“ by steam power.”

1. The first part of the invention relates to steam engines and winding apparatus.

2. A method of ploughing is described. The engine, &c, is placed at one side of the field, near the middle of the side, and “the hauling ropes are led along a “strip of land across “the centre of the field” termed the “midland,” to a pulley carriage traversing along the “midland.” “The “pulley carriage carries two pulleys, one for each hauling “rope, and the ropes pass round these pulleys in opposite “directions, the one passing to the right and the other to the “left of the carriage, and they work with two ploughs or “implements which are alternately hauled by the ropes from “the headlands up to the midland, and whilst one plough “&c. “is in action, the other together with its hauling rope is “taken back by a horse or otherwise.” Or the engine may be placed on the “midland,” while the pulley carriages traverse along the headland. Or the inventor uses “two “engines with one winding drum in connection with and “placed on each headland.” “The hauling rope from “each engine is in this case passed along the headland on “which the engine stands to a pulley carriage on the same “headland which traverses as the work progresses, and the “engines work alternately to haul each one its own plough or “implement from the midland to the headland.” With this arrangement horses are not required, as the plough in work draws back the one out of work. Similarly engines traversing along the headlands may be used, without pulley carriages.

3. The pulley carriage used is mounted on three wheels, the hinter part being mounted on stands or plates which can be turned so as to raise or lower the wheels. The front wheel is mounted with its axle in slots, at either end of which it can be secured by a pin. The carriage is anchored in its place by coulters, held down by weighted levers. The front edges of the coulters are sharp so that they cut through the soil as the carriage is moved along. If they meet an obstacle, the levers allow them to rise. Or blades may be used which are raised and lowered by a rack and pinion.

4. The traction ropes are by preference of wire over a hemp core.

5. The ploughs used have a skim coulter fitted to each separate plough. The shares are mounted on "lever necks" as in the method described in a previous Specification of the inventor. For use in "fenny land" a revolving disc coulter is substituted for the ordinary fixed coulter in each set. Sometimes a "subsoil tine" is fixed behind each mould board.

[Printed, 3s. 10d. Drawings.]

A.D. 1858, December 29.—No. 2980.

NEWTON, ALFRED VINCENT.—(*A communication.*)—"Ma-  
chine for reaping and mowing."

The main frame of the machine is supported on two running wheels, and can be raised and lowered by means of a pair of segment racks gearing with fixed racks on the wheel frames. Motion is given from a spur wheel on one of the bearing wheels to a pinion on a transverse shaft, and this by bevel gearing drives a crank shaft lengthways of the machine which operates the cutter. The cutting apparatus is carried by a frame pivotted to the main frame on centres in a line with the last-named shaft. The cutter can thus adapt itself to uneven ground without its action being affected.

There are also some improvements in the fingers and finger-bar. "1. The finger bar is made of wrought iron in an " 'ogee' form. 2. The base of the guard finger is made " to conform to the 'ogee' form of the finger bar so as " to rest upon the upper side thereof and support the cutter " bar, a mortice being made through the front curve of the " finger bar, through which mortice the guard plate passes, " the under part of the slot in the guard finger being on a " level with the upper edge of the finger bar. 3. A lip pro- " jects from either side of the lower half of the guard finger " for the purpose of supporting the cutters, and preventing " them from being drawn down enough to cut the edge of the " guards, and so that they will pass easily and smoothly " through the guards. 4. A rod extending under the finger " bar is connected to a wheel at the outer end and a lever at " the inner end of the finger bar, so that the height of the " finger bar and cutter may be adjusted at pleasure." Thus

is effected by mounting the wheel on a short arm at right angles to the rod, so that as the rod bar is turned on its own axis, a leverage is exerted on the wheel which tends to raise or lower the rod and with it the finger-bar and cutter.

[Printed, 10d. Drawings.]

A.D. 1858, December 30.—No. 2984.

VION, HIPPOLYTE CHARLES.—"New mode of obtaining atmospheric electricity and terrestrial electricity and its industrial applications, and in apparatus for the same."

"My invention" says the patentee "consists in an electric pile formed by the earth & by the atmosphere." A description is given of a method of collecting electricity by means of insulated conductors carried to the top of mountains, or connected to a balloon inflated with hydrogen formed by the decomposition of water, such decomposition being effected by the electricity obtained. The earth may be electrified by induction from wires laid therein, and this may be done "when great amounts of electricity are to be conducted on the surface of the earth for the wants of agriculture." "The positive conductors are directed upon the grounds to be electrified." "It is not indispensable sometimes to extend the positive conductors, but it suffices to lead the negative conductors across the ground."

[Printed, 1s. 6d. Drawings.]

A.D. 1858, December 31.—No. 3000.

ROBIN, HENRI.—"Reaping machines."

The machine is pushed forward by horses harnessed to a pole projecting from the rear of the machine. It is mounted on two running wheels, on the axle of which is a spur wheel connected thereto by a ratchet which allows the machine to run back. From this motion is given to a cross shaft with two cranks thereon at right angles one to the other. These cranks are connected by rods to opposite ends of a vibrating lever pivotted centrally. From this motion is transmitted to the cutters which consist of shear blades pivotted with a fixed blade between each pair. The row of cutters extends along the whole front of the machine. Behind it is an endless band running over inclined rollers, so as to form a sloping surface

on which the cut crop is received. The endless band delivers the corn at one side to an "inclined weir or overflow," "which guides the stalks in passing on to the ground, that is, while the foot of the stalks falls to the ground, the head slides along the overflow, and is gently placed upon the soil."

[Printed, 10d. Drawing.]

1859.

A.D. 1859, January 1.—No. 16.

VON KANIG, WILHELM ADOLPHE.—(*Provisional protection only.*)—"Apparatus for digging and cultivating land."

The apparatus consists of a frame, on which an engine and boiler are fitted. The wheels "may or may not be arranged with jointed or linked rail pieces to form a continuous railway." The first motion shaft drives a cam shaft, the cams on which "operate upon open frame pieces, one at each side of the main framing. These frame pieces carry detents or catches gearing with ratchet teeth upon or in connection with the after pair of ground wheels. In this way, the cams being formed to suit, the machine is impelled forward when at work with a step-by-step motion over the land, a pause being made at each turn of the cams to allow of the digging action going on properly." "The same train of gearing also actuates another shaft at the back end of the framing, which shaft also carries cams working in open frames for the actuation of the diggers. These diggers are in the form of spades set side by side across the machine to the intended width, each spade being attached to a lower cross shaft, working in bearings carried by a pair of the open frame pieces actuated by cams, so as to have an up-and-down vertical motion in suitable guides for putting the spades into and taking them out of the earth. The shaft on which the spades turn also carries curved arms against which other cams are made to work so as to turn the spades upwards upon their shaft as a centre." A "raker" is also attached at the extreme after end of the machine. This consists of a set of teeth carried by pendant lever arms from a shaft or

" moveable support above, adjustable as to height. The same shaft which actuates the digging cams also carries cranks with connecting rods for causing these raking teeth to vibrate." " The machine is steered at the front end by a hand wheel and chain barrel, the chain from which is connected at each end to a forward central lever piece connected with the travelling frame and vertical spindle of the front pair of wheels."

[Written, 4d No Drawings.]

A.D. 1859, January 5.—No. 39.

HOWARD, JAMES.—"Lever-neck plough."

Improvements on No. 13,678, A.D. 1851. In that Specification a plough of the above sort was described in which "the nose or forward extremity of the plough frame through which the lever-neck passes was left open or unclosed at bottom." According to the improvement the "nose" is converted into a closed socket by the addition of the metal figured as forming the bottom of the nose, which is thus closed at bottom. The sole plate is fitted "so that it will extend to the forward extremity of the frame," and the share is deepened so that the sole plate may be "flush with the under side of the share." The back part of the frame is slightly cranked "to enable the lever which carries the share to be made straight instead of cranked as heretofore."

[Printed, 6d Drawing.]

A.D. 1859, January 15.—No. 131.

BANKS, DANIEL LANCASTER.—"Travelling suspension rail or roadway to be used for the cultivation of land."

Improvements on No. 112, A.D. 1859, which does not allude to agriculture. The present invention so far as it relates to this series, appears to consist in a method of ploughing, &c. land by an implement suspended on a rail or rails, and travelling to and fro thereon by means of a suitable carriage, such rails being supported on frames which themselves travel, in a direction at right angles to the line of work of the plough, on rails laid down across the field. Ploughs, chod crushers, rollers, reaping machines, &c. may be thus used. Motion is given to the implement by a portable engine or otherwise.

Various sorts of rails may be used to support the implement frame.

A "portable fence" is referred to, which is mounted on wheels and can be removed from place to place.

[Printed, 1s 4d. Drawings.]

A. D. 1859, January 17.—No. 138.

HUGHES, EDWARD THOMAS — *A communication from Constant Beure and Edouard Barret.*—(*Provisional protection only.*)—"Apparatus for sowing seed."

The seed is delivered from a hopper divided into conical compartments to recesses in a revolving cylinder called a "distributor." Thence the seed passes into a "spout" pierced with holes corresponding in number with the compartments of the hopper. This is called a "moveable sower." "In each of the said holes is fixed a spoon or blade" which cuts a furrow for the seed. These blades can be pressed more or less into the ground by a handle behind. Within the hopper is a "regulator" to "stop the distribution of the seed when necessary." "A brush is also fixed to prevent the seed accumulating between the distributor and the hopper." The "distributor" is driven from the running wheels of the carriage on which the hole is mounted. The "sower" has a "stopper or guide to prevent the seed taking a wrong direction."

[Printed, 4d. No Drawings.]

A. D. 1859, January 18.—No. 156.

TROTTER, WILLIAM.—"Reaping machines."

"The table upon which the severed corn falls as it is reaped" is attached by means of hinges or other joint connections to "a beam or bearer, which is itself pivotted or centred to the side of the main frame." This beam is fitted along the side of the frame. In front of it is a small wheel carried by a lever pivotted to the front of the beam, so that by raising or depressing the lever, the beam may be correspondingly adjusted, and the cutters, which are fitted along the front of the platform, be raised and lowered. To admit of this movement, the connecting rod which drives the cutters is suitably jointed. The platform and cutters, when not in use, can be turned up on the hinges, and secured in a vertical position against the



side of the frame. The traction shafts are pin-jointed to the back of the frame, and supported at any desired height by an upright in front of the frame, and a transverse bar across the shafts.

[Printed, 10d. Drawing.]

A.D. 1859, January 20.—No. 173.

WOOFFE, WILLIAM.—(*Provisional protection only.*)—"Implements for ploughing, tilling and paring land."

The following is the whole Provisional Specification:—

"My invention consists in constructing ploughs and such other agricultural implements as are or may be constructed with beams, in manner hereafter set forth. I form that part of the beam to which the shares, or parers, or other tools for acting on the soil are affixed, in the shape of a frame, so that two or more sets of shares parers, or tools may be fitted to the same beam. I hinge this frame at front, and on an independent frame I mount an axis for carrying a front or guide wheel. At the back of the frame carrying the share, or other tools I place two large wheels, and cause them to travel within the path of the shares, parers, or tools. The beam frame, front wheel frame, and handles are so combined and united that, upon depressing the handles the shares, parers, or other tools are released from the soil, when the implement may be moved or turned upon its wheels. Another part of my invention consists in forming a skeleton or openwork mould board for parers when used for paring stubble; and instead of fitting the shank of paring knives in parers closely in the eye or loop, as is now done, I make the loop sufficiently large to enable wedges or screws to be used to effect the fastening. By employing wedges and screws, the knives may be readily removed, where as now they are found to rust and become fixed in the loops; they also admit of adjustment according to their wear. For some purposes where land requires to be pulverized or cleaned, my invention further consists in the employment of revolving teeth, which are set to act upon the soil while leaving, or immediately after leaving the turn furrow or mould board."

[Printed, 4d. No Drawings.]

A. D. 1859, January 24.—No. 216.

FOWLER, JOHN, junior, BURTON, ROBERT, GREIG, DAVID, and HEAD, JEREMIAH.—“Agricultural implements.”

The first part of the Specification refers to improvements in drums for hauling agricultural implements.

The second part relates to a method of connecting the traction rope to the implement and moving aside the supporting pulleys. There is a bell crank lever mounted on the implement, and to the ends of this the ends of the traction rope are attached. The return rope is thus carried out to the side of the implement, and laid on the unbroken ground. To move the supporting pulleys, there is a rail fitted at the side of the implement “the two ends of which pass just under the rope” in front of and behind the implement, so that when it comes “up to a pulley, the pulley runs from the rope on to the rail, and the curve of this rail causes it to move on the running wheels with which it is furnished out of the way of the implement.” “In order to cause the power of the steam engine acting through the hauling rope to raise the tines, cutters or tilling instruments,” these instruments are mounted “on a frame supported by wheels, the axle of which passes through vertical slotted openings in the frame.” “On the axle is a pinion which ordinarily revolves independently of the wheel, but which by a clutch can” “be caused to revolve with the wheel, and in revolving it runs along a rack formed for it on the frame,” so that the frame with the tilling instruments is raised.

[Printed, 2s. 6d. Drawings.]

A. D. 1859, January 24.—No. 221.

TASKER, WILLIAM, the younger.—“Ploughs.”

The ploughs referred to are those “known as fixed-headed ploughs,” and the object of the invention is to enable the plough to be turned at the headlands “without having to be carried round.” For this purpose the beam is fitted with its end in a tube on the fore carriage, so as to be free to turn therein. It is secured by a weighted catch fitted in notches in

two collars, one on the beam and one on the tube. Where it is required to turn the plough, the catch is lifted by a chain, &c., and the beam revolved in the tube until one of the plough handles rests on the ground. On this handle there is a "skid" on which the plough rests while it is being turned. When the beam is again brought back to its normal position the catch locks it. "The wheels are carried by adjustable stumps and axles, which are connected near their upper and lower ends with vertical spindles capable of turning freely in cylinders or other bearings fixed one on each side of the tubular casting." Or one such vertical spindle may be used, round which the axle may turn. "The draw iron consists of two parallel bars fixed rigidly to the lower ends of the vertical spindles," "and a cross-bar which is jointed at each end to the front ends of the parallel bars."

[Printed, 8d. Drawing.]

A. D. 1859, February 4.—No. 327.

PACKER, WILLIAM ROBERT JUSTICE.—(*Provisional protection only.*)—"Improvements in the plough or ploughshare, for the purpose of more effectually pulverizing, breaking up, or cutting into small particles the earth or sod separated from the ground by the ploughshare,"

The following is the whole Provisional Specification:—

"The invention consists in affixing to the plough or ploughshare works which, by the movement of the plough, are made to revolve, and thereby the earth or sod as raised or separated from the ground by the ploughshare, is brought into contact with rakes, spikes, or such like projecting instruments, and by their revolution or movement, cut or ground into small particles. These works consist principally of a cylinder placed to the ploughshare, which moves a wheel, and by means of this wheel a pinion, with or without a square or collette attached, studded with rakes, spikes or such like projecting instruments, revolves, and by such revolution the sod or earth, as separated from the ground, is crushed or cut up."

[Printed, 4d. No Drawings.]

A.D. 1859, February 8. —No. 353.

WALLER, WILLIAM. — (*Partly a communication from William Rogers.*)—(*Provisional protection only.*)—"Agricultural or farm implements or apparatus."

The improvements are in several sorts of implements,

1. In ploughs "the beam and head, or the beam and body, or the beam and mould board, or the sole plate or share and share" are cast together, also the "sole plate share and share are forged together." The coulter is fastened to the share or sole plate by "casting, welding, or otherwise." The coulter so connected may have its upper end inclined forward or backwards, and in some cases attached to the beam, in others not." The beam and head may be united by 'fishing' and the fishing plates may form the body of the plough."

2. Harrows are made with "inclined bars branching in opposite directions from longitudinal bars lying in the line of draught." "These longitudinal centre bars are jointed, so that the two halves are capable of folding together; a pair of such folding halves constitute a single harrow, two or more of which may be arranged side by side."

3. In mowing machines the reel is mounted on a frame "capable of easy adjustment." The reel blades also are mounted on adjustable arms, so that their "sweep" can be regulated. The motion of an endless web which delivers the cut corn at the side is alternately fast and slow, so as to deliver in bundles. Or "a tray or cradle may be arranged at the end of the endless web to hold the grain until the quantity to form a bundle is accumulated, where it may be deposited by the withdrawal of the tray."

4. In horse or hand rakes there is "a slide on the teeth which project forward, such slide having attached to it the ends of a couple of cords or chains which pass to pulleys and return to be attached by their other ends to the rake head, the rake being drawn by means of the pulleys. As the hay or corn to be collected accumulates, it presses the slide back towards the head, and when necessary it is discharged by slightly retarding the movement of the head by means of a handle fixed to it, the slide moving forward

" again. By a slight movement also of the handle the rake  
" is made to clear the rig after each discharge."

[Printed, 4d. No Drawings.]

A.D. 1859, February 8.—No. 358.

CLARK, WILLIAM.—(*A communication from Jules Romiguere.*)—(*Provisional protection only.*)—"Protectors for  
" tobacco plants."

The following is the whole Provisional Specification :—

" This invention consists of a simple method of protecting  
" the young tobacco plants against the attacks of worms and  
" insects. This improved protector is applied specially  
" to the protection of the stalk of the plant, for which purpose  
" I enclose the stalk in a small tube or pipe of baked clay similar  
" to drain pipes, which tube is about two or three inches in  
" length about half an inch in diameter, and about one quarter  
" of an inch in thickness. The stalk of the tobacco plant is  
" encased as above mentioned, care being taken to bed the  
" tube about half its length in the ground. By this means  
" the young plant is securely protected from the bites or  
" punctures made by the worms, and having at the same  
" time plenty of air & space will increase in growth and  
" perfection. The tube may be removed in about fifteen  
" or a greater number of days, according as the plant possesses  
" sufficient strength to resist the attack of the worms. This  
" improved arrangement as will be seen, is very simple and  
" inexpensive."

[Printed, 4d. No Drawings.]

A.D. 1859, February 10.—No. 381.

PERRY, CRANBY LANCELOT.—(*Provisional protection only.*)  
—"Agricultural implements for paring and ploughing land."

The following is the whole Provisional Specification :—

" This invention relates to certain improved mechanical  
" arrangements or contrivances constituting an agricultural  
" implement adapted for paring and ploughing land, and  
" consists of a framing supporting two, three, or more  
" instruments of the kind commonly employed for paring  
" or skim ploughing land, said instruments are intended to be  
" so arranged and disposed as to be capable of being raised and  
" lowered, or adjusted at will as may be desired. The afore-

"said paring implement it is proposed when required to  
"convert into an ordinary plough by substituting plough-  
"shares in the place of the before mentioned paring instru-  
"ments."

[Printed, 4d. No Drawings.]

A.D. 1859, February 11.—No. 389.

BARTLETT, HENRY ALBERT. — (*Provisional protection only.*)—"Machinery to be used with or without the plough  
"for clearing and cleaning land from weeds."

The following is the whole Provisional Specification:—

"The object of this invention is to clean ploughed land of  
"twitch grass and other weeds, and the machinery may  
"be applied to the plough or to any other agricultural imple-  
"ment, or be so constructed as to work alone. As applied  
"to a plough, it consists of a framework, extending lengthwise  
"beyond the ground iron, and vertically to the shafts or  
"handles. This framework has attached to it a driving wheel  
"which gives motion to a shaft, drum or roller, from which  
"pegs, hooks or teeth project, and in their revolution take up  
"the weeds they come in contact with. Another drum, roller  
"or shaft is provided with rakes, pegs or teeth for freeing the  
"first of weeds."

[Printed, 4d. No Drawings.]

A.D. 1859, February 16.—No. 431.

NEWTON, WILLIAM EDWARD. — (*A communication from John Peter Adrianec.*)—"Mowing machine or grass harvester."

The main frame rests on two bearing wheels, loose on the axle, and connected therswith by ratchets and palls. The palls can be held against the ratchets or away from them by springs, so that either wheel can be thrown out of gear, and the other only used as a driving wheel. The finger bar is connected to the frame by a "double-jointed bar or coupling piece," consisting of a bar, one end of which is jointed to the finger bar, and the other end to the frame. The finger bar may thus be "raised and folded over and upon the main frame."  
"The inner end of the finger bar terminates in or has a hooked  
"projections attached to it. "This projection, if the coupling  
"piece be elevated to a certain distance, will sustain the



"finger bar." The projection will not come directly in contact with the bar or coupling piece when the inner end of the finger bar is raised; some play is allowed in order to permit the finger bar and sickle to conform to the irregularity of the ground." The finger bar &c. is raised by a chain on a sector, with ratchet teeth which hold it in any desired position.

[Printed, &c. Drawing.]

A. D. 1859, February 16.—No. 437.

SEGUIN, JULES.—"Employment of moving power arising from the tides, and its application to manufacturing, agricultural, and other purposes."

The invention relates to a method of utilising the force of the tides by the employment of reservoirs, which are filled at high tide. No application to purposes connected with the present series is mentioned, except that it is stated that the power thus obtained may be used for draining land.

[Printed, &c. Drawing.]

A. D. 1859, February 26.—No. 520.

LEE, JAMES.—Ploughs.

1. The two wheels are on different axles. "These axles are suspended each from an axle or suspension rod; the bottom end of this axle rod is slotted out, and the axle can be set at any part of the slot." On the upper part of these rods are strong springs so arranged that the wheels bear against them, and are thus allowed to yield when passing over a stone, &c., without raising the plough.

2. The sole plate is formed of a certain shape slightly curved, "in such a way as to give the land side of the plate a twist or inclination, so that it will cut about an inch and a half or so more into the unploughed land than at the surface."

3. The beam is "straight on the land side, and nearly in a straight line with the land shaft," in order to lessen the friction and ease the draught.

[Printed, &c. Drawing.]

A. D. 1859, February 26.—No. 522.

**BURGESS, WILLIAM.**—"Reaping and mowing machines."

The object of the invention is to enable such machines to be readily turned while they are in motion. It is specially applicable to machines "where the inner bearing wheel is in "a line behind that of the main wheel." For this purpose there is a hinge joint, "behind the finger beam in the side "frame to which the small or inner bearing wheel is connected." There is an "additional side frame, to which the "upper part of the back framing of the machine is connected." The hinge "opens outwards."

[Printed, 6d. Drawing.]

A. D. 1859, February 28.—No. 531.

**HALL, COLLINSON, and HALL, COLLINSON, the younger.**—"Steam agricultural machinery."

1. A winding drum is described.

2. A method is described of giving motion to an anchor for steam ploughing. The pulley over which the traction rope runs has a boss on its spindle with two helical grooves therein. Studs on the ends of two levers pivotted to the frame work in these grooves so that a vibratory motion is given to the levers. Motion is communicated from these levers to ratchets which drive ratchet wheels on a shaft. This shaft has on it a pulley by which the anchor is wound up to a fixed point, or a screw, working in the ground, by which the required movement is given to the anchor. The anchor frame carries cutting discs, which penetrate the ground and hold the frame; these can be raised when required. Weighted cords are attached to tubes (telescopic or not) projecting out from the back of the frame. By their use other weights may be dispensed with.

3. For winding up the slack of the traction rope drums are mounted loosely on the axles of the running wheels of the implements. Corresponding conical surfaces are formed on the wheel and the drum, so that when the drum is forced against the wheel by a hand lever, it rotates with the wheel and winds up the slack rope. Constant pressure may, if preferred, be exerted against the drum by a spring.

[Printed, 10d. Drawing.]

A.D. 1859, March 1.—No. 542.

RIVERS, GEORGE PRY, Baron RIVERS.—(*Provisional protection only.*)—"Implement for breaking up and preparing land."

The following is the whole Provisional Specification :—

"My improved implement is a rotary cultivator, to be drawn by horse or other power, and is composed of a drum or cylinder or of a skeleton drum armed with tines fixed at intervals across the length and round the circumference of the drum. The tines are of wrought iron, and about fourteen inches in length, they are made to terminate in chisel points laid with steel, and are from one to three inches broad at the points. The implement is intended to be used for digging, forking, or breaking up and preparing land after it has been ploughed. It is capable of forking the soil to the full depth of the ploughing. Large travelling wheels are fitted to the ends of the drum to enable it to be moved from field to field, and to be drawn along roads."

[Printed, &c. No Drawings.]

A.D. 1859, March 5.—No. 581.

FRASER, JOHN.—Ploughs.

The improvement consists in a method of casting mould boards, so that the part most exposed to wear is harder than the rest. Two casts in plaster of Paris or other suitable material are taken from the mould board. One of these is used to make the pattern for casting, from the other the "chill" is cast. In the operation the chill is suitably disposed in the moulding sand, and by its use the required part of the mould board is "chilled" and therefore hardened.

[Printed, &c. No Drawings.]

A.D. 1859, March 5.—No. 584.

SAVAGE, WILLIAM PEACOCK.—"Machine for excavating, raising, and depositing soil."

The machine may be used for cutting drains, subsoiling, and various other purposes. It consists of a frame mounted on two pairs of wheels, each having a locking motion but capable of being fixed, so that the apparatus may go either end foremost, and have the pair of wheels which is for the

time being the hinder pair, fixed. Two sets of four wheels each may also be used. In this frame are mounted two smaller frames which each pivot on a transverse bar. These frames carry pulleys over which work endless chains having buckets fixed thereon. The frames can be raised and lowered, so as to bring the buckets to act on the soil, one set at a slightly lower level than the other. The endless chains are operated from a shaft driven by a band from a portable engine travelling in front of the apparatus. The same shaft also actuates winding apparatus which winds the machine up to a fixed anchor. The buckets are formed with cutting edges having curves or projections to break up the soil as it is raised. One set of buckets delivers the soil to a travelling band which carries it out to the rear of the machine, the other set delivers to similar sets which carry the soil to the sides. The soil may be received in carts, or suffered to fall on the ground. The two frames are linked together, to keep them an invariable distance apart.

Grubbers may in some cases be substituted for some of the buckets, and the position of the chain may be altered according to the work required to be done. When the soil is full of water, boards or scrapers may be fitted so that they scrape the soil, &c. up along an inclined board.

[Printed, 1s. 4d. Drawings.]

A. D. 1859, March 9.—No. 610.

WILLIAMS, JOHN ALLIN.—“Apparatus for cultivating land  
“ by steam power.”

1. A plough is described. It consists of a main horizontal beam, supported at the centre by a pair of large running wheels of which the one on the land side is adjustable in height by means of a rack and pinion. To this main beam a pair of beams is fixed at such an angle thereto in the same horizontal plane that the ploughs carried by these beams at suitable intervals may act properly on the ground. These ploughs are in two sets, one at each end of the implement, and are right and left handed respectively. Each plough is carried by a lever arm jointed to a sliding piece adjustable vertically on the beam before-mentioned. The free end of the arm (*i.e.*, the hinder end behind the share when the plough is in the ground) is weighted, and has a chain thereon led to a windlass

on the frame over the main axle-tree. These chains are so arranged that by the action of the windlass all the ploughs on one side are raised, and all the others lowered. Or there may be more than a single windlass similarly arranged if the work is too heavy to be effected all at once. There is a traction rope from each lever arm, close in front of the bar, and all the ropes from the ploughs of each set are led through separate holes in a cross-bar near the main axle-tree and connected to a draught bar on the other side of the axle-tree; the principal traction rope is then connected, by means of a short permanent length of rope, to this bar, and the return rope is hooked on to the end of the main beam, so that its drag is taken off the ploughs. For reversing the action, the implement is swung round on its main wheels "in such a manner as to bring its head over the "next cut of unploughed land." The strain of the hauling ropes on the cross-bar then draws the implement into position for the next bout. The ends of the frame are supported on small adjustable running wheels.

2. The second head of the invention refers to a scarifier or grubber. The frame of this is supported on a pair of running wheels, the axle-tree of which is pivoted on a vertical pin close to one of the wheels, and its other end plays in a horizontal slot in the framing, in which it can be clamped in any position. When an endless rope is employed for hauling, the ends are wound on drums at the centre of the frame. The rope which for the time being is the hauling rope is led through a guide eye and over an adjustable forked guide in front. The return rope is led round a curved casting in front, over a hook at the side which carries it clear of the wheels, and so back to the anchor or engine. This rope serves to turn the implement at the headlands. The other side of the endless rope runs over a loose pulley on a arm projecting from the side. Any sort of tines can be used. When an endless rope is not used the ends of the ordinary traction rope are connected to a cross bar, instead of being wound on drums. These are fitted to lever frames pin-jointed to blocks sliding on standards and connected to a lifting bar operated by an overhead lever. By this lever the depth at which the tines work is adjustable. A second lever frame may be pin-jointed on the frame so as to be free to rise and fall on the ground. All the frames can be raised by one and a windlass above. The tines on the front frame are

arranged to operate in the track of the running wheels as well as on the ground between, so that no wheel tracks are left. "Broadshares" or "ordinary harrow teeth, or chisel pointed tines," are carried by the hinder frame, or wheels may be mounted thereon instead of tines, and a harrow connected on behind. Chains are arranged to raise the harrow, which can be turned over on the top of the frame when the implement is being turned.

[Printed, 1s. 9d. Drawings.]

A.D. 1859, March 11.—No. 626.

HELLARD, ROBERT.—"Reaping and mowing machines."

The object of the invention is to "effect a better raising than heretofore" of laid corn by the use of "creepers." The inventor says "I prefer the creepers something the shape of a common plough coulter or an unground carving knife blade, the points of which are to be in advance of the knives, reaching near the ground, and extending the hinder part in a rising direction back over the knives or cutting apparatus, or the using of a feathered fingered knife guard, the point of which being always in advance of the knife brings it in a better position to be cut. My invention also consists in preventing short ears being cut off by placing a mechanical roller with two, three, or four wings behind the knives adapted for long or short crops. My invention also consists of binding the corn on the machine with its own material by employing a lever dividing rake, and placing a cradle platform on the side or part on which the corn is bound, by persons riding on the same for that purpose, on removing the cradle and leaving the corn as divided by the rake in sheaves on the ground, ready to be tied up. The corn being brought to the side or platform by using an endless band or bands of canvas or other suitable material travelling on rollers, and with an endless band for delivering a continuous swathes. The canvas being kept in its proper travelling position by iron or other rods fixed to chains attached to the canvas. I also claim the use of steel or metallic rods to act as reel vanes suspended over the front part of the knives from the machine for the purpose of causing the corn or grass to lean towards the knives and back part of the



" machine, so as more readily to fall in a proper direction  
 " when cut."

[Printed, 10d. Drawing.]

A.D. 1859, March 18.—No. 693.

LAMBERT, CHARLES.—"Corn and seed drills."

The invention consists in fitting a corn and "seed drill on  
 " the beam of a plough behind the turn furrow, and in  
 " obtaining motion in the seed hopper by means of a wheel  
 " travelling on the sole or bottom of the furrow." This wheel  
 is carried by a frame which also carries a train of cog-wheels  
 communicating the motion to a shaft passing across the hopper  
 and carrying a cup wheel. This cup wheel delivers into a  
 spout which distributes the seed in the furrow. "A sliding  
 " nut moved by a lever is attached to one of a set of cog  
 " wheels to regulate the delivery of the grain." The position  
 of the cog-wheels may be altered, or different sized wheels  
 introduced. The frame and wheels may all be raised by a cord  
 or lever. On the spout may be fitted a casting "bolted to the  
 " plough and provided with two holes, one to confine the seed  
 " in a row, the other to spread it."

[Printed, 6d. Drawing.]

A.D. 1859, March 19.—No. 706.

CAMBRIDGE, WILLIAM COLBORNE.—"Chain harrow."

The harrow is made in several parts, each part being fitted  
 with a row of hooks which engage with the links of the next  
 part. The first part is connected to a row of hooks permanently  
 fixed on links on the whipple tree, and the other portions are  
 similarly connected to one another, one behind the other.  
 The object of this is to vary the size and weight of the harrow.  
 To prevent the links slipping off the hooks, each hook has a  
 loose ring connected to its point, which hangs down and rests  
 against the shank of the hook, thus forming a stop which  
 requires to be raised by hand before the link can be dis-  
 engaged.

The "flexible transverse bars" described in No. 1153,  
 A.D. 1857, may be employed or not.

[Printed, 6d. Drawing.]

A. D. 1859, March 22.—No. 726.

**NEWINGTON, SAMUEL.**—"Apparatus for distributing seeds  
" and manure."

A hopper of triangular section is fitted on a pair of running wheels, the shafts for traction being fixed to the top of the hopper. One side of the hopper is hinged at the top, and may be set by a screw so as to leave a larger or smaller opening as required at the bottom between it and the opposite side which is fixed. The hinged side receives a jogging motion from a roller with projections thereon which strike against the lower edge of the side, or against projections thereon. This roller is driven from the running wheels. The seeds, &c., pass from the hopper on to the roller, and thence on to a sloping board which is jogged by a chain from the side of the hopper. From the board they fall on to the ground. The roller is fitted with a ratchet, so as not to be moved when the wheels run backwards. By means of a chain the vibrating side can be drawn against the fixed side and held there to prevent the seed or manure from passing when the apparatus is not required to be at work. To increase the amount delivered, the fixed side may be adjustable by screws. To sow in furrows a box containing the seed, &c. is placed in the hopper, and holes are formed through its side and the side of the hopper. The seed, &c. passes through these holes into funnels below which lead it to the furrows. Wires are arranged to work through these holes and clear them. Or boards may be arranged on the sloping board above-mentioned to guide the seed, &c. "Proper apparatus for forming the furrows  
" may be attached to the front of the machine."

[Printed, 10*l.* Drawing.]

A. D. 1859, March 22.—No. 727.

**BANKS, DANIEL LANCASTER.**—"Suspension rails or road-  
" ways."

Improvements on No. 112 (not included in this series) and No. 131, A. D. 1859. In the last named Specification a method is described of cultivating land by an implement suspended below a rail and travelling thereon, said rail being supported on frames themselves capable of motion, but in the opposite direction.

The power is to be applied by an engine fitted on one of the moveable "butfresses" or separate. "The standard or butfresses are so arranged that they may traverse across the ground simultaneously," "and are kept in position to each other, or parallel, by chains" &c. The machinery may be covered over by a shed, and this may be lighted by gas, &c. When required, "turntables may be placed in the end of the travelling suspension ways."

[Printed, 10d. Drawing.]

A. D. 1859, March 23.—No. 743.

DELANY, WILLIAM.—(*A communication from Lodner D. Phillips.*)—(*Provisional protection only.*)—"Ploughs for tilling land."

The following is the whole Provisional Specification:—

"This invention relates to a peculiar construction and arrangement of machinery or apparatus for breaking up and ploughing land, and consists in the employment of a number of wheels or cylinders fixed upon stationary horizontal axes carried in a rectangular or other frame. A cam groove is formed in the periphery of each wheel or cylinder which groove is in a plane at right angles to the axle, excepting at one part, where it is made to diverge slightly out of its course and to return to it again. These stationary cylinders are each enclosed by a pair of discs formed with flanges at their peripheries, and rotating loosely upon the axes: the flanges enclosing and surrounding the cylinders. These discs carry at their peripheries a series of cutters or knife edged plates, which radiate from the axes and revolve with the discs so as to cut the surface of the soil into strips, and then to turn such strips over, after the manner of the ordinary mould board of a plough, this latter operation being accomplished by the diverted portion of the groove, which acting upon the flanks of the cutters, inclines them and causes them to turn the soil or sod and so form furrows."

[Printed, 4d. No Drawings.]

A. D. 1859, March 29.—No. 736.

SPIGHT, ISAAC.——"Horse hoes."

"The hoes are attached to levers connected with a revolving shaft near the front of the machine. This revolving shaft

“ works on bearings in a slide frame, and is moved by turning  
“ a handle attached to a shaft working a rack or worm thread,  
“ by means of which all the hoes work on the same level.”  
This rod has on it a universal joint to allow the frame to be  
turned from side to side for steering. “ One end of each of  
“ the levers to which the hoes or hoe shanks are attached  
“ being fixed to this revolving shaft by sockets or otherwise,  
“ instead of hanging loosely as heretofore, the hoes will all  
“ cut level and not be liable to clip on one side. The depth  
“ to which the hoes penetrate the ground is regulated by the  
“ height of the revolving shaft in the slide frame. At the top  
“ of each of the hoe shanks is a socket which slides upon the  
“ lever connected with the revolving shaft, and which may be  
“ fixed in any position required for different kinds of corn or  
“ roots by set screws, clasps or otherwise.”

[Printed, 10d. Drawings.]

A.D. 1859, March 30.—No. 797.

**CARTWRIGHT, JOHN.**—“ Implements for crushing clods and  
“ pulverizing the surface soil, also convertible into a press  
“ wheel roller.”

The clod crusher is one of those composed of loose rings  
running side by side on a common axle. Every other ring or  
wheel runs on a ring or boss formed on the ring next it, and  
this runs on the axle. The ring running on the boss is made  
to fit very loosely thereon, so as to allow considerable play.  
The rings are all serrated, “the teeth being somewhat in the  
“ form of those of a saw with the points flattened, having  
“ one side perpendicular or nearly so, and the other side an  
“ inclined plane.” The “intermediate serrated rings may  
“ be either of the same external diameter or larger than those  
“ which run on the axle, and are to be about one-half the  
“ width of the latter, or less.” For clod crushing, the appa-  
ratus is to be drawn in such a direction that the points of the  
teeth enter the ground first; for use as a press wheel roller,  
the inclined surfaces of the teeth “should precede the points,”  
and therefore the caps of the brackets on the axle are loose, so  
that the position of the frame and shafts can be reversed.

[Printed, 10d. Drawing.]

A.D. 1859, March 31.—No. 804.

ROSS, ROBERT CRAIG.—(*Provisional protection only.*)—  
"Apparatus for cultivating land."

The following is the whole Provisional Specification :—

"This invention relates to improved apparatus for cultivating  
"land by horse, steam or other motive power, and has for  
"object the treatment of the soil in more effectual and eco-  
"nomical manner than has hitherto been attained. In one  
"modification of the apparatus the digging or cultivating  
"details are carried upon a simple rectangular frame or  
"carriage mounted upon wheels, and arranged to be drawn  
"by horses or ropes. The digging or cultivating mechanism  
"is of the rotatory kind, a series of digging blades or forks  
"being mounted upon a revolving drum or frame, which (in  
"this modification) is driven by a strap or otherwise, from  
"one of the axles of the supporting wheels. The digging  
"blades or forks are mounted upon studs parallel to the axis  
"of the drum carrying them, and are capable of turning upon  
"the studs in a manner and to an extent determined by a  
"stationary guide or guides. The guide or guides are so  
"shaped or contrived that each digging blade or fork enters  
"the soil vertically, or nearly so, to a certain extent, notwith-  
"standing the combined rotatory and progressive motion of  
"the digger drum. The blade has next an accelerated motion  
"succeeded by a complete or partial pause, and these com-  
"bined movements are designed to throw the soil off the  
"blade, and so avoid its being carried round. In another  
"modification the revolving digger drum, arranged as de-  
"scribed, is adapted to be worked by steam power. The  
"details of the apparatus may be modified in various ways,  
"the main feature of improvement being the arranging the  
"individual diggers upon the revolving drum, so as to be  
"capable of independent movement, such as are herein-before  
"described. If necessary or desirable the individual diggers  
"may be contrived to have a swivelling motion for throwing  
"off the soil laterally, and this swivelling motion may also be  
"imparted by means of fixed guides."

[Printed, &c. No Drawings.]

A.D. 1859, April 4.—No. 839.

**BROWN, WILLIAM, and MAY, CHARLES NEALE.**—(*Provisional protection only.*)—"Haymaking machines."

The following is the whole Provisional Specification :—

"We mount the rakes or prongs for tossing the grass or hay on the same axis as the carrying wheels of the machine. On the frame in connection with the shafts we fix a ring with internal teeth concentric with and in the plane of a pinion on the barrel or centre of the rake heads or prongs; we gear this pinion with the ring of teeth by means of three or other number of intermediate or idle wheels, which intermediate wheels are mounted on studs fixed to a plate carried round by the carrying wheels, which communicates a quick motion to the rakes or hay tossing apparatus.

"By thus using only one shaft, which passes directly from one carrying wheel to the other, a very stable machine is produced, and the whole rendered firmer and stronger than such machines heretofore used. We fit the rake arms with screws, so that the diameter of the rakes or tossing parts may be increased or diminished as required."

[Printed, 4d. No Drawings.]

A.D. 1859, April 7.—No. 868.

**WARDELL, ROBERT, and KEARSLEY, HENRY.**—(*Provisional protection only.*)—"Reaping machines.

Improvements on Wardell's Patent, No. 904, A.D. 1857. These improvements are arranged under the following heads :—

1. Using a "universal wheel" next the standing crop instead of a "fixed travelling wheel."

2. Instead of working the knife bar direct from a crank, connecting the bar to a "vibrating or swinging bar" worked by a crank.

3. Certain improvements in the gathering reel are described in the following words :—"We propose to make the arms of said reel about four times their usual width, and to place them edgewise on the reel instead of flat as heretofore, and to fix the boards used for throwing the corn on to the platform on the back side of such said arms, and to form such



" said boards curved instead of straight, that the ends of the  
 " reel may strike the corn, &c. before the middle part."

4. The "delivery prongs and sheaf collector" of the former invention are placed "direct behind the delivery rollers" so as to receive the corn therefrom. When sufficient for a sheaf has been collected, "the prongs are caused to move through a half circle of space by the weight of the sheaf. The axle to which the prongs are affixed has a crank at one end thereof, and a rod which connects the sheaf collector and the prongs together, so that as said prongs move in an arc of a circle, the sheaf collector is pushed backwards, and allows the sheaf to fall."

[Printed, 4d No Drawings.]

A. D. 1859, April 7.—No. 869.

CHAMPNEY, GEORGE. — (*Provisional protection only.*)—  
 Reaping machines.

"The corn is cut by means of a series of circular saws driven by straps and pulleys from a suitable driving spindle." An endless travelling apron carries the cut crop to a box or "type" with doors at top and bottom operated simultaneously by a lever worked by the attendant. As the sheaf falls from the box it "catches a straw band placed beneath to receive it, and then it lies on the ground ready to be bound up and "stocked." The height of the cutters is regulated by "a lever and moveable frame." An inclined dividing board is used. Behind the machine is a platform for the attendants.

[Printed, 4d. No Drawings.]

A. D. 1859, April 7.—No. 870.

LAKIN, JOHN, the younger. — (*Provisional protection only.*)—  
 —"Agricultural drill."

The following is the whole Provisional Specification:—

"My invention consists of an agricultural drill for drilling  
 " turnips, mangold wurzell and artificial manure, and for  
 " such other purposes as the same is or may be applicable to.  
 " The artificial manure is contained in a hopper, from which  
 " it is allowed to pass by means of a slide, which can be  
 " adjusted so as to permit the desired quantity of manure to  
 " fall. The said manure is received on a spout to which said

“ spout a vibrating motion is communicated by the advancing  
 “ motion of the drill. The said vibrating spout deposits the  
 “ manure by a sidelong delivery in a line on the fresh turned  
 “ furrow made by two single or one double furrowed plough,  
 “ which preceeds the drill. A prong in front of the drill  
 “ makes a channel for the manure and another prong behind  
 “ the vibrating spout stirs the said manure into the soil. A  
 “ small harrow attached to the plough covers in the said  
 “ manure. The main wheels of the drill run in the open  
 “ furrow, and are guided by it; the drill consequently requires  
 “ no steering. The drillman or attendant throws the seed  
 “ pulley into and out of gear at the turns, and lets down the  
 “ steadying wheels when the drill is out of the furrow. The  
 “ said gearing resembles that of an ordinary agricultural drill.  
 “ Owing to the readiness with which the vibrating spout frees  
 “ itself from damp substances having a tendency to adhere  
 “ thereto, my invention is particularly applicable to the dis-  
 “ tribution of ashes which have been saturated or moistened  
 “ with liquid manure. The essential feature of my invention  
 “ is the vibrating spout herein-before described, which said  
 “ spout delivers the manure by a sidelong delivery.”

[Printed, 4d. No Drawings.]

A.D. 1859, April 12.—No. 913.

JOHNSTON, GEORGE JOSEPH. — (*Provisional protection only.*)—“ Drills for drilling of corn seeds and manure.”

The following is the whole Provisional Specification:—

“ This invention has for its object an improvement in the  
 “ drill coulter by a rotary motion working on its own axis;  
 “ it is self-acting and self-cleaning for cutting of the earth and  
 “ for depositing of corn seeds and manure, and can be so fixed  
 “ at such distances, and to penetrate the ground to any depth  
 “ that may be required, and can be applied to any drill now  
 “ extant.”

[Printed, 4d. No Drawings.]

A.D. 1859, April 13.—No. 926.

COLEMAN, RICHARD.—“ Agricultural implements.”

1. Improvements on No. 10,885, A.D. 1845, and No. 1166,  
 A.D. 1856. Two sets of cultivators, acting in opposite direc-

tions, are set in a frame mounted on four wheels. The cultivators are pivotted to the frame, and their stems are acted on by a rod so that all those of one set can be simultaneously raised or lowered. The handles operating these rods may be connected, so that the act of drawing the implement in the reverse direction tends to draw the set that has been in use out of the ground, and thereby the other set into the ground. The wheels are mounted on stud axles carried by vertical stems mounted so as to be capable of turning on their own axis. This motion is communicated to them by short lever arms, the arms of the opposite wheels of each pair being connected by a cross-bar on which is a rack engaging with a pinion on a shaft running along the length of the machine. On this shaft are two pinions, one operating the front pair of wheels, the other the hind pair, and the pinions are of such length and so arranged that either or both can be kept in gear with its rack as required and then either the front or back pair of wheels turned to either side. The object of these arrangements is that when the implement has arrived at the end of its traverse, the wheels may be turned to one side, and the implement thus guided on to fresh land. While the machine is travelling straight forward, the levers are secured by pins, and the wheels thus prevented from moving. The traction rope is wound on a drum, and by means of a worm and worm wheel the slack may be taken up on this drum, or the implement moved if required.

2. In implements which require to be turned at the head-lands, any suitable device may be used to lock one of the hind wheels, so that it is prevented from turning, and the machine is therefore caused to turn on it as on a pivot. This may be effected by a cross-bar which can be slid on between the spokes, or even by a brake forced against the wheel.

[Printed, *ed.* Drawing.]

A. D. 1853, April 18.—No. 971.

WHITAKER, JOHN.—"Mowing machines."

The improvements relate to the guide wheels of such machines the bearings of which are "moveable instead of stationary so that they may be widened or contracted, according to the kind of mowing required. The said bearings or castors are placed upon the front rail of the machine and held fast by

"set screws, nuts or wedges." The short arm carrying the castor wheel, is fitted to slide along the rail and be clamped in any required position by a screw.

[Printed, 2d. Drawing]

A.D. 1859, April 18.—No. 972.

SEAMAN, JOSEPH.—"Agricultural implements for working or cultivating the soil."

1. A plough beam is formed of two flat metal bars, connected by struts, one of which struts is passed through a "slotted mortice" in the front part of the plough frame, and is clamped therein by a screw. The bars at this part are set wider apart, to allow the frame to be adjusted to one side or the other "to set the head of the plough more or less to land as required." Also "the hind part of the frame is furnished with an upright pivot or belt, and the tail of the beam has a vertical slotted or split mortice made therein" through which the bolt passes, and is secured at any height, so that it also serves to set the head of the plough at the height required. The draught chain may be led between the bars forming the beam. The inventor proposes "to fit the breast or turn-furrow to the share lever by a long staple or slotted hold-fast, rivetted fast to the inner side of the breast," "this staple being gripped by a long coupling rod also provided with a slotted mortice and tightening screw." The front of the breast has a "swivel holdfast rivetted or otherwise secured thereto" and "secured to the share lever by a modification of the slotted mortice." This method of attachment is also applicable "in lieu of set screws and loop screws to the adjustment of the wheel slides and standards, coulterns and couplings, and to the fixing of the tines or teeth of scarifiers, grubbers, or cultivators."

2. The teeth of harrows are secured by bolts extending right across the harrow, and passing through the heads of the teeth and through the beams. "Tubular stretchers" are placed on the bolts below the beams to keep them apart, and there are screw nuts on the ends of the bolts to hold the whole together. Or the frame of the harrow may be made separate, and the teeth secured to the sides of the beams by separate bolts. The heads of the teeth are recessed to fit the beams.

[Printed, 1st. Drawing.]

A. D. 1859, April 18.—No. 977.

**FREER, JOHN.**—"Machines for planting grain and seed."

The machine consists of a number of "planting wheels" mounted on a frame with running wheels. Each wheel is formed with a number of angular projections set radially on its periphery. These projections are hollow and are supplied with and form an apparatus contained within the wheel. Each one of them is fitted with a cover, which is opened when it is at the lowest point of the wheel by a pin on a rod connected with the cover striking against a small wheel inside the large wheel. A similar device is caused to close the aperture. The projecting pieces may be larger or smaller as required, or if preferred the spaces between may be filled up so that the wheel forms a rut in which the seed is delivered. A coulter may be fixed in front of the wheel. A wheel with projecting radial arms may be fitted within the large wheel so that the arms enter the openings in the periphery thereof as they rise from the ground and clear them. The seed delivering apparatus consists of a cup-wheel and spout, contained within the large wheel. It is stated that the main seed reservoir is placed outside the wheel, but it does not clearly appear how the seed is to be conveyed thence to the box within the wheel in which the cup-wheel, or endless chain of cups, works. The "planting wheels" are attached "to the general framework by T-shaped levers or shafts," and secured "with iron boxes having double recesses or bearings so as to allow the T-joints to pass each other." The "planting wheels" are attached together "in the rear of the said wheels by bars passing through grooves so as to allow the wheels independently to rise and fall."

The Provisional Specification states that "another mode of constructing the planting wheel is to make the interior resemble a smooth groove or channel, but with outlets for seed and coverers for the outlets." "The seed is dropped from the meter [cup wheel arrangement] into the channel, and is arrested at the place of deposit by means of a wire brush or scraper which, as the outlets are uncovered, forces the seed through into the earth."

The drawing attached to the Specification is a mere rough sketch, and it is consequently very difficult to understand the details of the apparatus.

[Printed, 1s. Drawing.]

A.D. 1859, April 18.—No. 980.

**COLLER, GEORGE.**—(*Provisional protection only.*)—"Mowing machine."

The following is the whole Provisional Specification :—

"I employ a framing of wood or metal of suitable height, mounted on wheels, the front wheel of which is connected to a large toothed wheel which communicates with other multiplying wheels, the last of which communicates with a cross shaft having an universal joint in its centre, the other end of said shaft is fitted with two grooved eccentrics, over which bands are passed connected to a chain moving round a vertical roller. A scythe is affixed to the bottom of said roller, consequently as the machine moves forward, motion is communicated from the driving wheel in front to the scythe roller behind, the scythe moving precisely the same as if in the hands of a mower.

"The machine may be drawn by a man or horse with little exertion."

[Printed, 4d. No Drawings.]

A.D. 1859, April 25.—No. 1041.

**TAYLOR, SAMUEL LAWRENCE.**—(*Provisional protection only.*)—"Agricultural implements," &c.

The implements are principally such as are actuated by steam power, and include the following :—

1. Single or double breasted ploughs are arranged above and below a shaft so that one set will plough in one direction the other in the other, the ploughs being revolved on the shaft and held in position by a bar suitably arranged. Subsoil ploughs, scarifiers, &c. may be similarly arranged. The ploughs, &c., "instead of being set to turn on the common axis in the plane of their direction of ploughing, may be arranged so as to turn over in the direction at right angles thereto."

2. "Jointed paring instruments" are connected to the "sole of ploughs to be used for paring the subsoil on the surface



" of the land." These are set "on bolts or joints, on which they can move so as to be set wider or narrower" as required. There is also "a small spud before each parer, and small hoes set in the reverse direction to the parer so as to cut a little beyond their breadth and beyond the points of the parers."

3. Scarifiers, rakes, &c. are arranged "on an axis or axes, which has a locking plate and a spring catch applied, which when let go allows the instruments to rotate on the axis," and thus to clear themselves from accumulated matters. "The next retaining notch in succession may retain the instruments out of action, or allow of a sufficient revolution to bring them or others on the same axis again into action, which may be assisted by the attendant."

4. In implements drawn by horses the inventor mounts the drag frame on the fore wheels and carriages in such a manner that it has an oscillating motion in two directions, the one at right angles to the other, "to allow for uneven land."

5. This head relates to agricultural engines.

6. A platform for "traversing implements" at the head lands is described. It is made with "a sliding part and stationary part" secured to the ground by holdfasts. "The pulley is mounted on the sliding part, and the operating implement advances on to the sliding part, suitable ways being provided for it to rise upon after the implement is on the slide; this part is traversed on its guides or rollers in the direction required, and is moved the necessary distance to be traversed sideways by the implement." The lower part of the platform is then "shafted ahead" for the next traverse. Sometimes the inventor mounts "this shafting platform on a small carriage carried by one or more rails sustained by uprights at an elevation above the ground; such standards may either rest on suitable feet or on wheels."

[Printed, &c. No Drawings.]

A. D. 1839, April 28.—No. 1072.

WHEAT, JOHN.—"Drilling machines."

The improvement consists in a method of steering such machines and enabling them to turn readily. "To a suitable

“ framing a wooden barrel is connected by a spindle ; around  
 “ this barrel a chain passes right and left, and is guided on to  
 “ a half-round wood gearing, to which the ends of the chain  
 “ are securely fixed ; on the top of the spindle of the aforesaid  
 “ barrel a handle is placed, so that by moving such said  
 “ handle from right to left, or vice versa in like manner, the  
 “ course of the machine will be directed as required.” The  
 semi-circular frame above alluded to is carried on the fore-  
 carriage of the apparatus, and the barrel is mounted in a box  
 on a vertical spindle carried by the main beam.

[Printed, &c. Drawing.]

A.D. 1859, April 29.—No. 1075.

CRANSTON, WILLIAM MCINTYRE.—(*A communication from  
 Walter Abbot Wood.*)—“ Grass-cutting machine.”

The seat of the driver is mounted on a pair of supports projecting up from the frame, and affixed thereto “ at a point  
 “ nearly perpendicular over the axle,” so that the driver’s weight may act with a leverage on the frame so as to raise the cutters when required. The frame is mounted on a pair of running wheels whence motion is given to a cross shaft and thence to the cutters. Ratchets are employed so that both wheels may serve as driving wheels. The cutter bar and finger bar are supported on a sort of spring plate, which rests on the ground and serves to lift the cutters over small inequalities. This may be fitted in two ways ; it may be rigidly fixed to a projecting part of the frame in front, bent down so that the bent part rests on the ground, and have its other end formed into a loop which fits over the axle, and plays up and down thereon ; or the inner end may be fixed to the frame near the axle and the outer end formed into a bar which plays up and down between friction rollers in front. In either case the finger bar is fixed to the curved part below. The finger bar and cutter bar are both of them thin and elastic, so that they may yield to inequalities in the ground.

The fingers are formed so as to have “ no exposed contact  
 “ surface where short grass or gummy matter can lodge.” They are cast in pieces of three or more together, and are united by a piece at the back which extends along the back of the fingers on their upper side, and by which they are secured

to the bar. The under parts of the fingers are also made with similar joining pieces, but smaller and formed to fit against the front edge of the cutter bar.

[Printed, 1 $\frac{1}{2}$ . Drawings.]

A.D. 1859, April 29.—No. 1081.

SMITH, THOMAS.—“Cultivating implements.”

One or more rows of tines are set in a suitable frame. The tines may be furnished with moveable points so as to be suited to different sorts of work. If there is only one set of tines, they are connected to a bar either permanently or so that they may be set at different distances apart. This bar is connected by links to a lever, pivotted to the front of the implement. The tines are mounted on a cross shaft on which they can turn, so that when the lever and by it the bar are depressed, the points are caused to rise out of the ground. The tines can also be raised and set at any required height by means of a lever. If more than one set of tines is used, the bars of all the sets have upon them arms connected to a lever as above.

[Printed, 10 $\frac{1}{2}$ . Drawing.]

A.D. 1859, May 5.—No. 1129.

CLARK, WILLIAM.—(*A communication from Louis Achille PrunEAU.*)—“Seed depositors or drills.”

The improvement mainly consists in driving the seed-distributing apparatus by a spring, instead of from the bearing wheels. The apparatus may be used by hand or affixed to a plough. It consists of a hopper, to the side of which is affixed a box containing the spring and train of wheelwork. This drives a corrugated roller below the hopper which regulates the passage of the seed to a tube below. The lower part of this tube may be of india-rubber. When the apparatus is fitted to a plough there is an additional “hinder share” for covering over the seed. “Several shares may be arranged “abreast, so as to form a compound drill.” The drill may be fitted to any suitable implement, and may be of any size, or driven by a movement of any speed and power, as required for different sorts of seed.

[Printed, 5 $\frac{1}{2}$ . Drawings.]

A.D. 1859, May 7.—No. 1148.

**BAMLETT, ADAM CARLISLE.**—Reaping machines, &c.

1. Two methods of actuating the cutters are described. On the driving shaft are two opposite wheels fitted with rollers; a lever is so mounted that it receives an oscillating movement from the rollers which is communicated to the cutter bar. A small fly wheel is added to regulate the action. Instead of the above, the wheels may be formed with cam surfaces, and the lever end fitted with a pair of small friction rollers. The wheels may be the bearing wheels of the machine, or may be placed on the same shaft.

2. Behind the cutters is a platform composed of a set of endless bands fitted with teeth, traversing across the machine. These deliver to a set of similar inclined bands which lift the corn and carry it under guide rods to a suitable height, when it falls into a division formed by radial arms on a horizontal shaft. As each division is filled, the corn is discharged therefrom by a partial rotation of the shaft, effected either by the weight of the corn or by mechanism from the driving apparatus. Or the corn may be discharged in a swathe, by allowing it to fall between guide rods.

3. The cross bars of the gathering reel are fitted with teeth. The bars are held with the teeth extended by a catch, which is acted on by a fixed stop allowing the bar to turn as it rises from the platform and thereby free the teeth from the corn. Or the bar may be carried by a frame sliding radially on the radial arms of the reel, and suitably acted on by stops. Other suitable gear may be used for throwing the teeth into and out of action.

4. An inclined endless band with teeth may be fitted so as to form a "continuation of the fixed divider." A similar band may also be fitted on the side of the machine away from the standing corn.

5. The cutters are sharpened by means of files, a number of which are fixed on a bar over the cutter bar. This bar is so mounted that the files can be brought down on the cutters by a hand lever when necessary. When the files are held down on the cutters, the movement of the machine effects the desired sharpening. There are slots in the fingers, and the files are mounted therein.

6. The belts forming the platform behind the cutters may have different speeds, so as to carry the corn round. Additional belts at the side and running in a direction at an angle to the first set may also be used.

7. The wheel next the standing crop may be mounted in a block which will "swing round like a castor." The height may also be varied by a slotted arc on this block.

8. For raising the machine, either for turning or to regulate the height of the cutters, there is a "snail piece or circular incline round the upright stem or axis of a fore wheel or wheels. This upright axis has radial arms or rollers which bear against the inclines." The stem is rotated by any suitable means, by hand or otherwise.

9. A similar arrangement may be applied to cultivators, &c., the traction link or chain being attached to a radial arm carrying a roller, which, when the horses drag round the implement, the radial roller arm is at the same time dragged round, and by traversing round the incline raises the tines of the implement out of the ground."

[Printed, 1s. 4d. Drawings.]

A. D. 1859, May 11.—No. 1186.

SALTER, WALTER, junior.—(*Provisional protection only.*)—"Hay-making machines."

The wheels on which the revolving rake is mounted run loosely on a "single fixed axle," cranked or straight, not on a pair of short axles. On each wheel is "a cog wheel, which by the aid of gearing are arranged to turn the drum or rotatory rake in two directions, first, to distribute the grass when cut over the land, and secondly, when partly dry to turn the grass over." The rake runs loose on the axle, and is driven in either direction "according as intermediate axles (one on each side of the machine) are caused to turn in one or other direction by the driving cog wheels." "Each of these intermediate axles has on it three pinions, one is constantly in gear with a toothed wheel on the end of the drum or rotatory rake when at work;" another "is arranged to gear with a toothed wheel or pinion on a third axle, and such third axle is arranged to be driven by the pinion thereon taking into the driving cog wheel;" and the third

" is arranged to gear at times with the cog wheel on one of the running wheels." "A hand lever is used to move the proper pinions into and out of gear with the driving cog wheels." The rake also can be thrown entirely out of gear by a lever "which is so weighted that the machinery may be kept in a state of balance on the fixed axle, so as to put more or less weight on the horse."

[Printed, 4d. No Drawings.]

A. D. 1859, May 14.—No. 1207.

MUNRO, JOHN MAY. — "Manufacture and arrangement of chain harrows."

This invention consists in the use of short bars "for keeping the harrow extended, such bars being used with or without spikes, hooks, or rollers; also in the use of spikes or wheels attached to any part of the harrow, or so arranged that they will follow or lead either the link track or between the links, also in the use of diagonal bars in short or long lengths, for the purpose set forth in the above first clause, to be applied to harrows, either with or without spikes, hooks, or rollers attached to them; also in the use of any size metal worked or cast thick and thin, so as to secure greater strength where the harrow is subject to most wear or strain; also in the use of rollers or crushers in connection with harrows."

[Printed, 10d. Drawing.]

A. D. 1859, May 18.—No. 1229.

ROMAINE, ROBERT. — "Means of applying steam power to the cultivation of the soil."

1. Improvements are described in winding drums, including a method of guiding the traction rope between sheaves with the object of preventing the rope slipping.

2. The second head relates to a "travelling anchor, which within a given range will be self-adjusting." A "double-headed rail or bar" of any convenient length is mounted on low wheels, and secured along the headland by anchors of any suitable character. Flanged antifriction rollers, connected by metal straps, run on this bar and grip it. A frame jointed to these straps carries a sheave over which the endless rope runs. Rollers on the ends of this frame serve to raise the sheave off



the ground. The sheave and frame are carried along the bar by the "lateral drag of the traction rope," and when the sheave is thus carried to the end of the bar, the bar is shifted lengthwise and again anchored. For use on sloping ground, and in irregularly shaped fields, the bar is perforated with a row of holes and the roller links are secured by a pin passing through one of these, the pin being shifted from one to another as required. Instead of the bar, &c., a rope stretched along the headland may be used to guide the pulley.

[Printed, 10d. Drawing.]

A.D. 1859, May 24.—No. 1283.

PAGE, EDWARD.—(*Provisional protection only.*)—"Horse drags or rakes."

The tines are made of iron or steel, the "section of which is of an oval character or thicker in the middle, diminishing to the top and bottom edges." The tines are attached to their heads "by forming such heads with sockets adapted to receive the end of the tine" and they are secured to their sockets by set screws or rings. "The improvements relate also to adaptation of means by which, whilst the tines are free to follow the irregularities of the soil, they may be all readily removed therefrom for transit or otherwise. For this purpose the axis of the heads of the tines is formed with a rib or feather, and that part of the socket embracing the axis is partly cut away to admit of such feather and to an extent sufficient to admit of the axis with its feather turning freely therein; and these parts are so arranged in relation to each other, that for ordinary work the tines may be free to act with their points on the ground but when it is desired to lift the tines with their points from the ground" by turning the axis referred to by means of a suitable lever or otherwise, the feather or rib acts to lift all the tines, so that their points may be off the ground."

[Printed, 4d. No Drawings]

A.D. 1859, May 25.—No. 1290.

HOWARD, JAMES.—"Horse rake."

The apparatus is formed with a rectangular frame carrying *stud axes* for the bearing wheels. The tines are mounted

independently on a fulcrum rod of the ordinary description, prolonging the heads thereof, and forming them "with a loop" which gives them each a double bearing on the rod, and "thus increases their stiffness and prevents them from swaying laterally on their rod." Over the prolonged ends a bar is fitted, passing across the frame and supported by bracket arms pivotted on the ends of the fulcrum rod. This bar is connected to a hand lever, by depressing which the heads of the tines are depressed and their ends raised. The bar is held up when not in use by a spring, so that the tines may follow inequalities in the ground. Fixed rods are arranged between the tines to clear the produce therefrom as the tines are raised. These rods are secured at their forward ends to the fulcrum rod and at their hinder ends to a slotted adjustable bar clamped to the frame. The tie rods from front to back of the frame are cranked at their forward ends, and serve to support the fulcrum rod. To set the frame at any required angle it is connected to the shafts by bracket arms which "rock on centre pins in the shaft irons." "The extremities of these bracket arms are formed into segment racks which gear with pinions on a horizontal axle having its bearings in the shaft frame." By turning this axle the bracket arms are worked and the frame adjusted as required.

[Printed, &c. Drawing]

A.D. 1859, May 30.—No. 1328.

BRUCE, JOHN.—"Agricultural drills."

The improvement consists in a method of raising the shares or coulters from the ground. The coulters are carried by horizontal weighted levers, pivotted at their forward ends to the frame. A chain from each lever is carried up and fixed to a cross bar or roller above. Beneath this roller and parallel thereto is a second roller, connected by arms to the first. On rotating the first roller, the second roller is raised, and it carries with it the chains, thereby raising the coulters. A ratchet and pall keeps the coulters in their raised or depressed position. To keep the coulters down, a bar lies across their levers, and this bar is carried by levers similar to those carrying the coulters. From these upright levers project, which are jointed to the horizontal levers. From each upright lever there is a chain, which passes down under the lower

roller and is fixed to the upper roller. The effect of this is that when the lower roller is raised, the pressure is taken off the chains, and the coulters allowed to rise. While the roller is depressed the chains are kept tight and pressure is communicated through the levers to the cross bar which keeps the coulters down.

[Printed, &c. Drawing.]

A.D. 1859, May 30.—No. 1331.

**MAGGS, OLIVER.**—Harrow.

The harrow is formed of a number of blocks, preferably of wood, to which the tines are fitted. The under side of each block may be shod with a cast-iron plate on which the tines are formed. These blocks are connected together by chains to form the harrow, the first row being connected to a draw-beam and the others in a similar way to the blocks of the front end. The blocks may or may not be linked together; they may have any number of tines each, and may be arranged so that the tines act in rows, or alternately or otherwise. They may be round or square. The tines may be of any suitable shape. The harrow may be enlarged or diminished in size by adding to or taking from the number of blocks.

[Printed, &c. Drawings.]

A.D. 1859, May 30.—No. 1333.

**BLACKBURN, ISAAC, and BLACKBURN, ROBERT.**—Traction engines, and implements connected therewith.

A traction engine is described, suitable also for various agricultural purpose. With regard to the only part of the invention relating to the present series, the inventor says:—"For cultivating the soil, we employ, in addition to other implements, rotary cultivators consisting of a cylinder or cylinders placed behind the drum" (on which the engine travels) "and made to rotate by its outward motion through the spur or bevelled gearing on the outside of the drum. The cylinders are armed with straight or bent tines." "We fit hauling apparatus on the guide frame" "for the purpose of drawing or hauling ploughs or other implements in hilly districts where the locomotive would remain stationary." One of the drawings shows a cylinder mounted at the back of

the engine, and driven by an inclined shaft, on one end of which is a pinion gearing with a spur wheel on the face of the bearing wheel, and on the other a pinion gearing with a similar wheel on the tire cylinder. "The depth at which the tines work in the ground can be regulated at will, and arrangements are provided for raising the cylinder wholly out of the ground when it is not required for use."

[Printed, *is.* Drawings.]

A.D. 1859, May 31.—No. 1348.

ROBERTS, FREDERICK, and ROBERTS, ALEXANDER.—"Apparatus employed for ploughing, tilling, or cultivating land when steam power is employed."

"A rectangular frame is mounted on wheels in such manner that the frame may be raised or lowered as may be required. This rectangular frame carries several horizontal bars, to which ploughshares and coulters, cultivating tines, or other suitable tilling tools are bolted or fixed. Each of the horizontal bars has a vertical stem attached to each of its ends, and these stems pass up in guides or sockets fixed on the frame; they have toothed racks formed on them into which gear pinions mounted on axes carried by the frame. Each such axis carries two pinions gearing into the two stems of one of the horizontal bars, and it receives motion from a worm gearing with one of the pinions, so that by turning the worm by means of a crank handle mounted on its axis, the horizontal bar, together with the tilling tools it carries, may be raised or lowered as may be required. The rectangular frame is carried by means of three wheels one in front and two behind. The front wheel is used as a steering wheel, and is mounted on a standard which passes up through guides on the frame, and they may be turned round to set the wheel at an angle to the frame when it is desired to turn either by gearing or otherwise. By means of suitable levers the front of the frame may be raised to a greater or less distance above the steering wheel as may be required. The hinder wheels are mounted on studs formed at the extremities of arms, which at their other end turn in bearings carried by the frame. The arms or studs should be forged in one piece with the arms to obtain sufficient strength; these arms by suitable levers and connecting rods

" or otherwise may be set in a more or less inclined position  
 " to the frame" and the height of the frame thus adjusted.  
 The apparatus is " particularly applicable to be used in con-  
 " junction with a traction engine."

[Printed, 10d. Drawing.]

A.D. 1859, June 8.—No. 1399.

EDDY, CHARLES WALTER.—(*Provisional protection only.*)—  
 Reaping machines.

The following is the whole Provisional Specification:—

" My invention consists in allowing a part of the corn, when  
 " cut, to fall on a sloping platform, such platform to be formed  
 " of boards or other materials placed at small intervals apart,  
 " and in these intervals there are placed in an upright position  
 " slips of iron or of wood, having their upper edge cut into  
 " steps; or in lieu of these pieces of iron or wood, wires bent  
 " into similar form. These slips of iron or wood, or wires to  
 " be framed together and attached by a connecting rod to a  
 " crank, by the revolution of which crank they receive an  
 " alternate motion, by means of which the corn which falls on  
 " the platform is gradually thrown off it to the ground, and  
 " is thus removed out of the way of the horses when tra-  
 " versing the ground, which has been reaped for the purpose  
 " of cutting the crop still standing. The aforesaid slips of  
 " iron or wood or wires are either attached to the cutting bar  
 " of the machine or separate therefrom, but in either case  
 " have a horizontal motion, or a motion approaching to the  
 " horizontal, and thus as they traverse the sloping platform  
 " in one direction project above it, and as they move in the  
 " opposite direction recede to a level with or below the same.  
 " I also claim three methods of supporting the frame of the  
 " aforesaid apparatus for delivering the corn, viz., either by  
 " hanging it on slings working on a pivot, or by allowing it to  
 " work on guides or slides, or by a combination of these two  
 " methods."

[Printed, 8d. Drawings.]

A.D. 1859, June 9.—No. 1402.

BURNESS, WILLIAM.—" Steam culture machinery."

The Specification is divided into 18 heads, under which  
 various descriptions of agricultural implements are referred  
 to. There are also 8 paragraphs detailing the supposed advan-

tages of the different inventions comprised. There are no illustrative drawings, but the inventions are all described at considerable length.

1 to 9.—These heads refer to engines and drums. There is also a reference in (9) to the use of springs in "rotary diggers" amongst other apparatus.

10.—An anchor "of two kinds." First a frame carrying pulleys capable of being lowered close to the ground. The frame has "a steerage motion for turning round bends." The pulley has its bearings on springs. The part entering the soil may be a plough or scarifier, to act on the ground as the anchor is moved. These coulter, &c. may be raised and lowered by racks, &c. Weighted levers may be mounted on the frame. The anchor may be moved by winding up a rope on a drum. It may travel along a portable railway "plain or with rack and pinion." The second anchor is a "grapnel anchor of the common sort," to which weighted levers are connected. "It may work in pits or short trenches dug for it, in a plough furrow or ditch of the headland, or instead of grapnel prongs, it may have two pulleys or grooved rollers, and be made to work along a rope or chain or beam of iron or wood, fixed at both ends by means of a common iron skew stake."

11. The various pulleys, &c. have their bearings on springs. When endless ropes are used the guide pulleys have "a bracing action, so as to guide the rope or band tight on to the drum, and they have likewise friction brakes, to prevent their running too fast when the motion of the drums is reversed."

12. The "bridle" connecting the implement to the endless band, or to the traction engine, has springs connected to it. Also "it may carry a drum for winding up the slack of the rope."

13. Four kinds of cultivators are described under this and three of the succeeding heads. They are to be actuated by steam power. First kind. Two parallel bars or frames carrying ploughs are arranged so as to "move diagonally along the land, the one bar being in advance of the other." They are fitted with castor or other wheels. "Each beam turns horizontally upon a pivot or fulcrum in a bolster or saddle that slides along or in the tillage bar, so as to regulate the



"distance between the ploughs." "Each beam carries a right & left turnover or mould board and share, also a breast bar and coulter common to both turnovers; likewise a right and left skim coulter on a common stalk." "Each plough has also a drag chain in front and a subsoiler behind." The ploughs may be raised, separately or together by racks, &c. Springs may be fitted to the ploughs. There are "graduated stops or checks" for keeping the plough beams on the main bars at any angle. The traction rope is connected to a "bridle bar" fixed to the end of the first bar. Steering is preferably effected by giving a "to-and-fro motion to the bridle along the bridle bar" by a rack or otherwise. "To assist in turning at the headlands, a stay wheel may drop alternately from the rear end of the tillage bar." Instead of ploughs any other cultivating apparatus may be similarly fitted.

14. Second kind. A frame is supported on two main wheels, a land and a furrow wheel, and on two castor wheels, one at each end. "From the land side of the framing a tillage bar or frame runs diagonally to the opposite side, a little in front of the furrow wheel, so that there are two tillage bars, the one carrying right-hand turnover ploughs and the other left-hand." These bars are preferably hinged to the frame, so that their angle therewith can be raised.

15. "The third kind of cultivator has but one tillage bar." "The principle of novelty consists in the working parts" "turning in the tillage bar," and also the bar in the frame. "The tillage bar works horizontally on a vertical spindle dropping from the axle of the main wheels" or "from a cross beam." "Each end of the tillage bar is alternately fixed or bolted to the furrow wheel side framing in front, and the land wheel side in the rear."

16. A "simple, cheap, and effective" scarifier is formed of a frame, rectangular, triangular, circular or polygonal, supported on castor wheels, and fitted with tines that can be turned in either direction and fixed.

17. Fourth kind. This is constructed of a "forked part of a tree" to which tine bars are to be fitted. It is to be mounted on castor wheels.

18. Seed and manure drills, harrows, hoes, &c. may be constructed on the same principle of turning in at the head-

"lands" "by their working diagonally along the field, so  
"that they have only a half turn to make, or from one diagonal  
"to another." Harrows are to be attached by one corner to  
a draught bar hauled by the engine.

[Printed, 1s. No Drawings.]

A.D. 1859, June 10.—No. 1411.

TYLER, SAMUEL WHITFORD.—(*Provisional protection only.*)  
—"Harvesters."

The following is the whole Provisional Specification :—

"I make use of a suitable frame, beneath the forward end  
"of which is a castor or pilot wheel so connected to the  
"tongue by a clevis that the wheel will travel more or less  
"obliquely to overcome the resistance of the cutter bar. The  
"power to vibrate my cutters is derived from one or more  
"wheels on a cross shaft in aforesaid frame, and on the same  
"shaft is a wheel having a zig-zag groove around its periphery  
"acting on a roller attached on a pendulous lever, to the  
"lower end of which the cutter bar is connected, and receives  
"its motion from aforesaid zig-zag groove. The upper end  
"of this pendulous lever forms the fulcrum by being attached  
"to a standard so set in slides on the frame that the parts can  
"be moved to draw the roller out of the zig-zag groove to  
"stop the motion of the cutter bar. The inner end of the  
"finger board carrying the cutters is hinged to a vertical  
"slide whereby the whole finger board and cutters can be  
"lifted or turned up vertically, or the height from the ground  
"regulated by lifting the said slide by a lever. The finger  
"board itself is made by a metal bar having a groove in its  
"upper surface, and a lip at the front edge of said groove,  
"under which a lip on the cutter bar passes; a bar behind  
"the cutter bar keeps that in place, and the fingers are  
"attached by bolts passing through said bars, and through  
"flanges at the back ends of said fingers; the cutters on said  
"bars travel or vibrate over slotted plates attached to the  
"fingers."

[Printed, 4d. No Drawings.]

A.D. 1859, June 17.—No. 1461.

DEAS, DAVID.—Reaping machines.

The platform behind the cutters is inclined, and is fitted  
with endless belts carrying spikes which carry the corn to the

side. The belt next the cutters is placed close thereto, and revolves on rollers with axes at right angles to the platform. The spikes are jointed to the belt "so as to turn in the plane thereof, and they have projecting tails" which strike against fixed stops so as to erect the spikes. "They are held vertically "by hooks" "rivetted to the belt, the bending of the belt "round the pulleys" "causing the points of the hooks to "leave the surface of the belt, and to admit the spikes at one "end and release them at the other." The other belts have their surfaces about flush with the surface of the platform, and the spikes on them project at right angles to the side of the belt. The spikes have "tails" on them at right angles, and these pass through slots in the belt, and slide on guide bars below, thus keeping the spikes upright. The guide bars stop short near the end of the belt, so that the spikes are free to fall over and discharge the corn as they reach the edge of the platform. The belts are preferably driven "from the side "towards which the delivery takes place," and the platform and cutters are connected to the driving apparatus by joints, so that they may follow the inequalities of the ground.

The "tails" may be made to form counterparts of the spikes, so that the action of the apparatus may be reversed, either portion forming the spike. Or the spikes may have "duplicate tails" to act in the reverse direction.

The dividing board may have similar spiked belts upon it.

[Printed, &c. Drawing.]

A.D. 1869, June 22.—No. 1502.

GOULDING, WILLIAM. — (*Provisional protection only.*)—  
Ploughs.

1. The object of this part of the invention is to enable the point of the share to be "set down" by means of a "lever "neck," and yet to keep the proper relative positions of the mould board and share. The inventor says, "For this purpose "I connect together the share and the body or frame of the "plough, as heretofore in ploughs, in which lever necks are "not employed, and in place of fixing the slipe to the frame, "as heretofore, I attach it thereto by a joint at its fore end, "so that the sole plate or bottom of the slipe may be raised "and lowered independently of the body or frame." The parts are fixed in position by a screw and nut or otherwise.

2. A method of mounting the wheels of the fore carriage is described. Two bars are secured to the lower part of the beam by screws and nuts, "and these bars have attached to them at " their extremities the standards to which the wheels are " secured." This is effected by bending the end of the bar at right angles and fixing the standard by screws in a fork formed in the end of the bar. It is stated that "by this arrangement " the wheels may be brought opposite to each other and the " adjustment of the distance between the wheels and also of " their distance from the beam is easily effected."

[Printed, *ad.* No Drawings.]

A. D. 1859, June 22.—No. 1504.

RUSSELL, WILLIAM.—"Wheels for ploughs, cultivators, and " other implements or carriages."

The wheel has the outer portion of the nave cast in one piece with the spokes or otherwise connected thereto. It has a recess to receive the end of the axle. The back part of the nave "is of a cup form" and has flanges by which it is bolted to the front part. It has also a hole through which the axle passes. "Within the cup the axle has fixed on it a boss or " bushing of cast iron, which fits the interior of the cup." This cup and the boss consequently become the wearing parts and they are easily renewed. In the front part of the nave is a small aperture closed by a screw plug. Through this oil is supplied. Washers of suitable material are used to make the joints tight. When the wheel is used for a plough a stud axle is employed, carried by an arm. The inventor prefers "to " attach the boss to the axle, when stud axles are employed, " by casting it thereon."

[Printed, *ad.* Drawing.]

A. D. 1859, June 24.—No. 1521.

HORNSBY, RICHARD, junior.—(*Letters Patent void for want of Final Specification.*)—Ploughs and means of giving motion to the same.

1. The share is made to "curve upwards in the centre" and has a cutting edge with an angle of about 65°. It is of cast iron. For "lever neck ploughs" the socket of the share is "underneath the working face instead of projecting beyond " it." Or lever neck ploughs may be adapted for receiving

shares with projecting sockets "by employing a covering " piece between the mould board and the share." A "vertical " pin which serves as a coulter" is cast in one piece with the share, or it may be separate therefrom. The "vertical plate " of the slipe or slade" is "much longer than the horizontal " or sole plate." The "portion of the vertical plate" " which projects beyond the sole plate " is sometimes in a separate piece and supported by stays from the handles and mould board. This plate "is not of the same depth throughout " its length but slopes upwards." Or the two plates may be of the same length, and the sole plate "towards its further " end bevilled or curved upwards" "or a short slipe of the " ordinary construction may be employed," together with a stay passing "from the handles or other part" "and resting " against the land side of the furrow, at some distance behind " the end of the slipe." This stay may have a friction wheel thereon.

2. For steam ploughing the "coulters usually employed" are removed and instead thereof shares having vertical fins "projecting upwards from them" are used; "or separate " fins may be employed fastened to the land sides of the " ploughs or to the shares." The inventor proposes to "combine drag chains with compound ploughs" "in order " to bury grass or rubbish." A "comparatively weak coupling " piece" is used to connect ploughs, &c, with the traction apparatus, so that it may break if there is any great resistance, and the apparatus be saved from injury.

3. Some improvements are described in the winding drums of agricultural engines.

[Printed, 4d. No Drawings.]

A.D. 1859, June 29.—No. 1548.

HALL, GEORGE, junior.—(*Letters Patent void for want of Final Specification.*)—"Reaping machines."

The pin of the crank driving the cutter has on it an "antifriction pulley and works in a slotted slide that traverses " to and fro in a guide" on the front bar of the frame. An eye on the slide works on a transverse rod. The slide is attached to the cutter bar, which works "across two of the stationary " fingers." The band driving the gathering reel has holes

therein which work over pins on pulleys on the driving shaft and the reel spindle. "The transverse shaft of the reel is "carried in adjustable elongating rods, one of which is fitted "on the axle of the driving wheel" and the other on a stud in the frame. The reel is held by a ratchet and pull arrangement. "Two of the radial arms," of which there are six, "are "arranged twice the distance asunder of the rest so that a "pause takes place in the gathering action of the reel once "during each revolution; the apron or platform on which "the cut crop is gathered by the reel is made to deliver the "crop in quantities ready for binding up into sheaves." "The platform is hung so as to oscillate upon a diagonally "arranged supporting shaft, it is kept in its angular or normal "position by a blade spring." The platform is tilted once in "each revolution of the driving wheel" by a tappet. In front of the machine is an adjustable guiding wheel.

[Printed, 4d. No Drawings.]

A.D. 1859, June 29.—No. 1545.

WRAY, WILLIAM, and WRAY, JOHN.—"Reaping machines."

A worm wheel on the end of the axle of the main running wheel drives a worm on a crank shaft which, by means of a jointed connecting rod, gives motion to the cutters. Metal pieces "formed either with square or curved shoulders," against which the edges of the knives act, are "fixed to the under side "of each of the fingers." The platform has endless belts travelling across it to carry the grain to the side. There is a "hinged flap or board to receive the butts of the corn or other "grains as it comes from the straps;" there is also a "rod to "receive the heads."

[Printed, 10d. Drawings.]

A.D. 1859, July 7.—No. 1610.

JONES, THOMAS DAVID.—(*Provisional protection only.*)—*Ploughs.*

The following is the whole Provisional Specification:—

"My invention consists, firstly, in the following method of "shifting and adjusting the shares of ploughs. A vertical "screw is carried by a mortice block, which slides on a hori-



" zontal bar placed across the plough at its back or behind  
 " the share. The lower end of the said screw engages in a  
 " slot in the lever of the share and the upper end of the said  
 " screw is terminated by a thumb nut. The mortice block in  
 " which the said screw works is fixed in its place on the bar  
 " on which it slides by means of a thumb-screw. By the said  
 " vertical screw and mortice block any motion of the share,  
 " whether vertical or horizontal, can be effected. My inven-  
 " tion consists, secondly, in the following method of altering  
 " the drawing tackle of ploughs. A bridle on the end of the  
 " beam of the plough is made to rise and fall vertically by  
 " means of a screw passing through its head. The said bridle  
 " is connected with the said beam by the vertical sides of the  
 " said bridle working in dovetail grooves in the sides of the  
 " said beam. A horizontal screw is supported at its ends by  
 " the said bridle; the said screw passes through a plate in  
 " the drawing chain, and by turning the said screw by means  
 " of a winch or handle on its end, the plate in the drawing  
 " chain is made to advance in either direction on the said  
 " screw, and the inclination of the drawing chain to the  
 " plough varied at pleasure."

, Printed, 4d. No Drawings.]

A.D. 1859, July 8.—No. 1633.

WOOFFE, WILLIAM. — (*Provisional protection only.*) —  
Ploughs

The following is the whole Provisional Specification :—

" My invention consists in the employment in ploughs of an  
 " additional coulter and of a revolving pulverizer, in manner  
 " hereafter stated. I construct my ploughs with two beams  
 " set about four and a half inches apart, and upon the left  
 " beam I fit a coulter and a share, with mouldboard of any  
 " ordinary construction. Upon the right beam I fit a coulter,  
 " which slices off the land to be turned by the turnfurrow, to  
 " the thickness, say, of four and a half inches, and I also fit  
 " upon the right beam, opposite to the body, and a little in  
 " the rear of the front of the turnfurrow, a spiked roller free  
 " to revolve on its axis."

[Printed, 4d. No Drawings.]

A.D. 1859, July 8.—No. 1634.

NICHOLSON, WILLIAM NEWZAM.—Hay-making machines.

The invention relates to the following heads :—(1.) arranging the teeth of "double action hay-making machines," so that they do not follow in the same lines; (2.) using a "larger number of fork heads than heretofore;" (3.) "working the machine with the tines the reverse way;" (4.) using the machine for "raking and collecting hay, weeds" &c.; (5.) "attaching blades for cutting thistles and other weeds."

The object of setting the teeth in different lines is to make the machine available for harrowing, manure spreading, &c. For this purpose a large number of "heads" are used, and these are set so that "the arrangement on every third fork head is alike." "This does away with the necessity for an additional number of teeth." For harrowing, &c. the tines may be turned the reverse way, and for this purpose either the tines themselves may be reversed, or the whole machine may be "inverted by turning over the shafts." "For this purpose the back band, collar and harness hooks are made reversible, or a set is attached to each side of the shafts." For "raking or collecting hay or weeds," a lever is attached by a joint to "the centre of the axle or other convenient part of the machine, to which lever catches are fixed which drop into grooves made in the bush to which the flyers with the teeth attached revolve. By raising or depressing the lever the forks are held firm, so as to act as a rake, and when full are released and allowed to revolve till another set is brought into work, when they are held firm in their turn." For cutting thistles and weeds, cutting blades are fitted to the teeth, the ends of the teeth being formed with screws, and the blades secured thereon by nuts.

(Printed, &amp;c. Drawing.)

A.D. 1859, July 8.—No. 1635.

NICHOLSON, WILLIAM NEWZAM.—"Clod crushers and land and garden rollers."

1. Clod crushers and rollers are mounted "with some or all of the separate rollers in a frame or frames connected by universal joints to the axle of the front roller, or some other part of the roller frame." These separate parts are therefore

free to "run either just before or just behind the central " part." The object of this is to enable the roller to accommodate itself to uneven ground.

2. "Plain rollers" are made "with the bushes sunk a few " inches within the rollers" and with "a collar with a wide " flange next to such sunk bush." "By this arrangement " the dirt that drops from the edge of the roller is kept from " the bearings."

3. Some improvements in garden rollers are described.

4. A hollow axle is used, closed at the ends and fitted with perforations through which oil can be supplied.

[Printed, 8d. Drawings.]

A.D. 1859, July 9.—No. 1637.

SAMUELSON, BERNHARD, and SHAW, JOHN.—(*Provisional protection only.*)—"Reaping and mowing machines."

1. Improvements on No. 270 [720], A.D. 1858. The bearings the main axle, and "the frame containing the rack quadrant," &c, are fixed on a "rigid bed plate," thus forming "the bed " plate for the driving and raking parts independent of and " capable of being detached from the framing which supports " the platform." There is attached to such bed plate a " carrier for a second wheel when the machine is used without " platform." One object of this is to allow the working parts to be sent out from the factory ready geared and fitted together. " Recesses are provided at the front and towards the back of " bed plate into which the finger beam and the cross beam " supporting the platform are respectively fitted."

2. The finger beam is "of hollow metal," either a "cylindrical or oblong tube, so as to be hollow by itself" or "a " bar with or without projecting flanges, the hinder part of " the fingers being so formed and attached to it that the series " of them shall form together with it a hollow structure."

[Printed, 6d. No Drawings.]

A.D. 1859, July 13.—No. 1656.

MUNN, WILLIAM AUGUSTUS.—"Reaping machines."

Principally improvements on No. 1889, A.D. 1857, Burgess's *Patent*.

1. In order to prevent the tendency of the machine to swerve towards the standing crop, the driving wheel is made slightly conical, or with a projecting rim.

2. A rake is fitted to the machine, which rakes the ground at the side, and helps to prevent the sideways draught of the machine. This rake can be raised or lowered by a rope attached to its outer end.

3. A "movable stage" is fitted to the side of the platform, which has on it Archimedean screws as described in the Specification above cited. This stage is swung on a pair of pivots, and is revolved at intervals by means of gearing thrown into and out of action by a clutch lever operated by a cam. The stage is preferably a metal frame covered with canvas loosely stretched thereon. Its object is to discharge the crop in bundles of size suitable for sheaves. The stage instead of being revolved may be tilted, and brought into position again by a spring. The Archimedean screws are thrown out of action while the stage is being turned, and there may be a flange on the end of the stage which prevents the crop passing off the main platform while the stage is out of position.

4. The frame carrying the knives and the platform is attached to the frame carrying the driving apparatus so that the former may rise and fall on uneven ground. This is effected by "attaching the frame which carries the knives, and the " frame which carries the Archimedean screw rollers, to the " frame to which the driving wheel and motive power are " attached each by a horizontal bar passing through perpendicular slots at the back part of the last-mentioned frame, " and working on pins also fixed at the back part of the said " frame."

5. The arms of the gathering reel are formed of several pieces hinged together in such a way that by shifting their relative positions the ends carrying the vanes may be caused to extend more or less from the central shaft.

6. This head relates to "forming the edges of the cutting " knives of a trefoil shape" and "making two re-entering " curves on either edge of that part of the fingers through " which the knives pass." It is also preferred "to have " the edges of the under sides of the knives fluted" and to " incline the points of the knives a little downwards."

7. The roller screws are octagonal in section or of any other suitable polygonal figure. "From the angles at the sides of the roller, plates of zinc or other metal project, having a waved indentation along the outer edge." The indentations are so arranged as to form a helix on the roller. The rollers revolve at gradually increasing velocities being driven by endless bands over pulleys of different sizes.

Besides the above, the following heads are referred to in the Provisional Specification but not in the Final.

8. The divider is formed of radial arms on a horizontal shaft. These arms have on them "claws," "projecting in the direction in which the arms revolve." "These claws work on pins, and project out some distance on the opposite sides of the arms." By rods and eccentrics, &c., the claws are made to "close up as they approach the ground, and take hold of the corn, and unclose when they rise."

9. The knives have "an edge like a fine saw."

10. "Certain of the fingers" have pieces of "iron projecting forward and sloping downward" to pass underneath laid corn and raise it. These pieces "have a certain play up and down" to allow them to pass over uneven ground, and for the same purpose their ends are curved up.

[Printed, 1s. 4d. Drawings.]

A.D. 1859, July 16.—No. 1690.

CRANSTON, WILLIAM McINTYRE.—(*A communication from Walter Abbott Wood.*)—(*Complete Specification, but no Letters Patent.*)—"Delivery apparatus for harvest machines."

The invention consists in employing a platform with endless belts, the delivery side of which platform is inclined to the front. This may be effected by setting the belt roller on that side at an angle, and fitting small pulleys over which the belts pass and are diverted to the angle required; or by using belts of different lengths and fitting a row of separate pulleys along the inclined edge of the platform. There is "a shield at the frame end of the platform, which may be a simple piece of bent wire that will catch and partially retain the butts of the stalks," while the heads are carried along by the belts.

[Printed, 4d. Drawing.]

A. D. 1859, July 21.—No. 1717.

HEALEY, HENRY.—(*Provisional protection only.*)—"Machine for destroying flies and other insects on growing crops."

A board is mounted in a suitable frame on wheels, so as to be adjustable horizontally at any suitable height from the ground. Brushes are carried by a bar behind the rod, so that they can be arranged to suit the rows of plants. The board is smeared with a sticky composition, preferably of "gas tar and sulphur." The insects are disturbed by the brushes and caught by the sticky matter on the board. The board is so hung that it can be turned up for the purpose of removing the insects and applying a fresh coating of composition.

[Printed, &c. No Drawings.]

A. D. 1859, August 6.—No. 1817.

STEWERKROP, EDWARD ALBERT.—(*Partly a communication from François Leroy.*)—"Reaping and mowing machines."

The axle of the main driving wheel has on it two discs, with cam surfaces on their opposite faces. The end of a lever carries rollers which fit in between the discs, and thus impart an oscillating movement to the lever. This movement is transmitted to the cutters. The lever can be slid backwards and forwards to throw it into or out of gear with the cams. It is held fast in either position by a catch. The lever may be acted on by springs, one on each side, to assist the action of the cams. The rest of the machine is to be of the ordinary construction. It may be used with or without a platform.

[Printed, &c. Drawing.]

A. D. 1859, August 19.—No. 1908.

FOWLER, JOHN, junior, BURTON, ROBERT, GREIG, DAVID, junior, ALLEN, EDWARD ELLIS, and WORBY, WILLIAM.—"Ploughs, cultivators or tilling implements," &c.

1. The first part relates to implements fitted with ploughs at both ends, each set being raised alternately as the implement arrives at the headland. The shares, &c. are fitted on frames carried by levers at their ends. The levers at the inner end of each frame are fitted to a central frame carrying the main



bearing wheels; the levers at the outer ends are connected to a beam fixed on the central frame. The frame and the ploughs &c. on them are thus capable of an up-and-down parallel motion only. On each frame is a drum on which the traction rope is wound. The pull of the rope on this drum depresses the frame and forces the ploughs, &c. into the ground. This at the same time raises the other frame and lifts its ploughs, &c. out of the ground.

2. Instead of all the ploughs, &c. of each set being at one end of the implement, they may be set with (say) two at one end and one on the other, frames being arranged so that one frame carries two at each end, and a second one at each end.

3. Of the two furrow wheels, which may be employed in implements of the character, that "which follows the tools" may be raised out of work. "These wheels may be mounted" one at each end of a lever centred to the side of a frame, so "that by rocking this lever, one wheel will be raised and the other depressed."

4. Instead of the arrangement described under (1), the following may be employed. Frames as above are connected at their inner ends to levers as before, but their outer ends are supported on arms pivotted to the frames and carrying wheels. Each of these arms, when vertical, supports its respective frame and ploughs, &c. above the ground. When its upper end is drawn forward, the wheel is carried out behind, and the end of the frame falls. This upper end of the arm is connected by a rod to a bell crank lever pivotted at the fulcrum of the central lever and connected thereto. The upper end of the arm is also connected to the spindle of a pulley capable of sliding a short distance on the frame supported by that arm. The traction rope is fixed to the centre of the implement, and led each way over these pulleys, one at each end. The effect of this is that the pressure of the rope on the pulley causes the latter to slide, this by its connecting rod draws down the end of the arm, the rod from this acts on the central lever, and thus both ends of the frame are simultaneously lowered. A reverse motion, starting from the other end of the central lever, raises the other frame in the same way.

5. A cultivator is described. Its frame consists of three arms radiating at equal angles from a central point. The traction ropes are attached to two of these arms, each of which

in turn becomes the leading one. On each arm, at its end, is a wheel. "One of these wheels is an ordinary swivel or cam wheel, but the wheels at the ends of the arms to which the hauling ropes are attached are carried by brackets which turn on vertical axes at the ends of the arms." The bracket of the leading wheel is fixed by a pin. The two brackets are kept parallel by connecting rods, and similar rods are fitted to the stems of the wheels, to keep the wheels in the same direction. The tines are fitted so as to be free to swing round into the position required. The implement is steered by a handle which can be applied to the stem of either wheel as it becomes the leading wheel. The traction rope is connected to a drum on a vertical spindle at the centre of the implement. This drum has a pin to hold it locked while the implement is at work. The rope is held along the arms through a swivel eye in the head of one of the tines.

6. This head refers to the engine.

7. For taking up the slack of the traction rope, one or more drums are mounted on the implement. This drum receives motion from a spike wheel mounted so that it can be forced into contact with the ground and thereby be caused to revolve. This is preferably done by a treadle. The wheel is raised by a spring. The drum is held by a ratchet.

8. Drums for agricultural engines are covered with india-rubber or a soft metal. Some other improvements in drums are described.

9. The anchor carriage is moved by power applied through the traction rope. A drum is fitted so that by causing it to wind up a rope it propels the carriage forward. This drum is driven by a rope ending in a clutch which is hitched on to the traction rope. The clutch is disengaged by a line attached to the anchor carriage, which only allows the clutch to reach a certain distance when the strain on this line disengages it.

[Printed, 2s. 10d. Drawings.]

A.D. 1859, August 22.—No. 1923.

HARVEY, RICHARD BUTTON.—(*Provisional protection only.*)

—"Apparatus for dusting vines, hops and other plants and trees with sulphur and other powder."

A blower apparatus of the usual sort used for fumigation has attached to it a "cylindrical chamber" containing a cir-

cular brush driven by a band from the spindle of the blower. " The sulphur or other powder is introduced into a suitable " air tight chamber in connection with that in which the " rotatory brush is contained, so that there may be a constant, " and if desired a regulated, supply of powder " to the brush. The bristles strike against a "fixed brush or instrument " suitably placed, so that they throw the powder into the stream of air from the fan which carries it through the spout. A length of flexible tubing with a delivery spout thereon may be attached to the usual spout.

[Printed, 4d. No Drawings.]

A.D. 1859, August 25.—No. 1939.

SMITH, HENRY, and ASHBY, THOMAS WOODHOUSE.—(*A communication from J. Pinius and Co.*)—Harrow.

The harrow is composed of a circular frame, formed of concentric rings with cranked bars uniting them. At the centre is a vertical spindle, to a radial arm from which the draught gear is attached. From a collar on the same spindle a radial arm projects, and this can be held at any angle with the draught arm by a link and sliding collars on the arms. This second arm is weighted, and the effect of this is to drive the tines on the weighted side deeper into the ground than those on the opposite side. The harrow is thus caused to rotate on its axis while it moves forward, and the tines therefore describe curves instead of straight lines. By bringing the weighted arm in a line with the draught arm, this rotary movement is no longer produced. The two arms may also be formed in one piece, so that the angle cannot be varied. Several harrows may be connected together by tie rods.

[Printed, 6d. Drawing.]

A.D. 1859, August 27.—No. 1955.

BELL, GEORGE.—"Reaping and mowing machines."

Improvements on No. 2291, A.D. 1857.

1. Instead of the "ordinary belt delivering apparatus" a pegged chain is used, an inclined "shield" being used to raise the cut crop off the points of the pegs at the side where it is delivered, so that the crop may not be carried round under the endless chain.

DIVISION I.—FIELD IMPLEMENTS.

2. A rake is attached to the hinder part of the machine so that it projects from one or both sides (when the machine is "propelled" from behind). This rake may be raised at intervals, by hand or automatically, to form sheaves. This is effected by pins on the main shaft acting on the ends of levers connected to the rakes. The rakes may be raised entirely clear from the ground by cords.

3. In the Provisional Specification a method is referred to of forming the "delivery rollers" with "swells" or "bulges" thereon, but in the Final this is disclaimed.

[Printed, *ed.* Drawing.]

A.D. 1859, September 8.—No. 2051.

NICHOLSON, JOSEPH.—Horse rakes.

The object of the invention is to provide an arrangement for lever horse rakes "whereby the teeth of the rakes are balanced, "so as to afford greater facility for freeing them from the "collected matter. In carrying out this invention it is proposed to apply to the inside of the main framing of the "rake a secondary frame, working on a transverse bar or rod "extending from side to side of the main framing. The "heads of the several teeth are carried by and work freely "upon the front portions of the inner or secondary frame, "which is connected by a double-forked connecting rod to "an overhead hand lever, the back free end of which works "in or against a segmental guide. By depressing this lever, "and engaging it into a catch or notch, the teeth will be "elevated from the surface of the land, and maintained so "elevated until the release of the lever again. A moveable "catch fitted on to the segmental guide bar enables the "lever to be maintained elevated, and the teeth raised to "any desired height above the ground. The inclination of "the points of the teeth is also capable of being regulated, "by adjusting the height of the main frame, in conjunction "with the greater or less elevation of the lifting lever, this "adjustment of the frame being accomplished by means of "slotted quadrants and tightening screws."

[Printed, *ed.* Drawing.]

A.D. 1859, September 9.—No. 2057.

ROSCOE, WILLIAM.—“Machine for distributing guano and  
“ other manures.”

A long hopper is mounted on a pair of wheels and has shafts attached to it. A revolving agitator is fitted to work within it. Along the bottom is a slit over which a sliding plate is caused to reciprocate, the movement being given it by a cam on the axle. This “reciprocating agitator” has teeth upon it, and may be formed with spaces alternately plain and fitted with teeth to allow of the manure being distributed in rows. The slit can be closed or its width regulated by slides worked by racks and pinions on a shaft running along the side of the hopper. To stop the action of the implement, the end of the reciprocating plate can be thrown out of gear with the cam by lowering the same by a screw.

[Printed, 10d. Drawings.]

A.D. 1859, September 14.—No. 2092.

MARRITT, JOHN.—“Double-action rotating harrows.”

Two circular harrows, rotating on vertical spindles, are connected by a cross-bar uniting their spindles. A brace from the top of each spindle is connected by a pin to the cross-bar so that the harrow is slightly tilted over, and the tines on one side driven deeper into the earth than those on the other. A rotary motion is thus given to each harrow. Draught bars are attached one to each spindle, and to a horse tree in front. The length of the bars is not quite the same, so that one harrow slightly precedes the other. “The spikes may be formed in  
“ two or more rows towards the centre.” The harrows “can  
“ also be made to rotate by bringing the ends of the draft  
“ bars ” “close together, or opening them wider.”

[Printed, 6d. Drawing.]

A.D. 1859, September 15.—No. 2093.

ROBINSON, JOHN.—“Agricultural implement.”

The implement consists of a combined rotary harrow formed of several circular harrows connected together. Each harrow is formed of several concentric rings with radial arms, the arms being bent, so that the tines, which are at the points of jun-

tion, may not be in the same radial line. There is a central vertical spindle, which may be weighted, and to this forked draught bars are swivelled at top and bottom of the spindle, their other ends being attached to a horse tree of greater length than the cross-bar uniting the separate harrows. The object of this is that the draught bars may not form a right angle with the cross-bar, and that the harrows may thus be rotated, each on its own centre. The cross-bar is curved near its ends, and swivelled on the central spindle close above the frame. A brace connects the top of the spindle with the angular part of the bar. This bar is adjustable by means of a pin and a row of holes. The length of the draught bars is not quite the same, so that one harrow may be slightly in advance of the other. Any number of harrows may be used, and they may be caused to rotate in the same or different directions as required.

[Printed, 8d. Drawings.]

A.D. 1859, September 23.—No. 2162.

BENTLEY, THOMAS. — (*Provisional protection only.*)—  
"Agricultural implements for gathering and destroying weeds  
"and stubble."

The object of the invention is to gather weeds, &c., and convey them into a furnace where they are burnt, the ashes being distributed over the ground by the machine as it progresses. A set of hoes or scarifiers is mounted in a suitable frame on wheels. A spiked roller is mounted on the frame so as to take up the weeds, &c. and deliver them to an endless band with spikes which conveys them to an incline leading to a furnace. The combustion may be aided by a blast if required. No more particular description is given of the apparatus, which may be worked by horse or steam power.

[Printed, 4d. No Drawings.]

A.D. 1859, September 27.—No. 2187.

BEARDS, THOMAS. — "Ploughing and cultivating land by  
"steam power."

Instead of the furrows of every alternate bout being close together, according to this invention "the ploughing is produced in the ordinary way as when ploughing with horses,  
"that is to say, the plough or set of ploughs, after having



wheel in the reverse direction by acting on an internal spur wheel on the running wheel or otherwise.

2. The divider is formed of an ordinary finger by affixing thereto a curved bar which extends backwards from the point of the finger.

[Printed, ed. Drawing.]

A.D. 1859, October 15.—No. 2355.

**ECHARD, JOSEPH.**—(*A communication from Mr. Estlimbaum.*)—"Apparatus for ploughing and sowing."

A hopper is mounted on a frame with a pair of wheels. It is divided into compartments, and a shaft passes along it, on which is a rotary starter in each compartment. There is an aperture at the bottom of each compartment covered by slides. Below the hopper is a frame, pivotted to the front of the carriage frame, and capable of being raised or lowered by a lever working along a quadrant, or a pinion engaging in a segmental rack. Shares are fixed at the back of this frame, corresponding in number with the compartments of the hopper. The stem of each share is hollow, so as to form a tube down which the seed passes, and into the top of this tube a bent tube with a funnel is inserted. A sort of two-pronged fork is pivotted to the stem of the share, so that the points of the prongs rest on the ground behind the share. For clearing the shares a fork may be fitted behind each share, and these forks may have a jogging motion given them from the axle. These shares can be moved, and the corresponding discharge holes in the hopper closed. When the nature of the ground requires it, the seed tube may be shifted from the front to the back of the share, so that it delivers the seed on the ground before the share, the latter then carrying the seed and soil to the sides, and leaving a furrow between which serves as a drain.

[Printed, 1s. Drawings.]

A.D. 1859, October 31.—No. 2478.

**BROWN, ISAAC.**—"Treatment of growing crops."

The invention consists in a method of supplying water and liquid manure to the crops, and also in a method of supplying heat to the same. A system of pipes is laid down over the

A.D. 1859, November 4.—No. 2511.

**KOCH, LOUIS.**—"Moving tread power."

This "mechanism for obtaining motive power" is applicable to reaping and mowing machines. It is described as applied to a small machine worked by a man pushing it from behind in the manner of a wheel-barrow. The cutters are rotary curved knives, arranged radially on vertical spindles. A pair of pulleys are mounted loosely on a transverse shaft, so that by means of ratchets they impart motion to the shaft when turned in one direction, while springs are arranged to wind up the drums in the other direction without turning the shaft. On each pulley a band is wound, the end of which trails on the ground. The man pushing the apparatus treads on one of the bands, and thus unwinds the band off the pulley, thereby revolving the pulley. His next step he treads on the second band, letting go the first, and so on. A continuous motion is thus given to the shaft, and this is transmitted in any suitable way to the cutters. The cutting edges of the knives are "on the outer circumference."

[Printed, 6d. Drawing.]

A.D. 1859, November 12.—No. 2568.

**BURGESS, WILLIAM.**—"Mowing and reaping machines."

The finger beam, &c. is hinged to the hinder end of a bar extending from front to back along the side of the machine, and pivotted to the front of the frame. The hinder end of this bar is supported by a lever with a small wheel on its lower end. By altering the angle of this lever, the cutters can be raised or lowered. The lever is held in position by a catch engaging with one or other of the teeth of a rack. The machine can be backed by the arrangement described in No. 2336, A.D. 1859. When the finger bar is turned up on its hinge, it can be held up out of the way by a hook near the driver's seat.

[Printed, 6d. Drawing.]

A.D. 1859, November 19.—No. 2620.

**LE PONTOIS, AUGUSTE HONORÉ.**—"Machines for distributing seed and manure."

The manure is contained in cylinders, revolving on a horizontal shaft. Round the interior circumference of each

heavy roller is fitted at the extremity of a radial arm so that it may run on the outer rung of the frame and thus depress one side more than the other, so as to drive the teeth on that side deeper in the ground, and thereby give the required rotary motion. Or the weight may be simply carried by a radial arm at right angles to the draught bar, instead of running on the frame.

2. A number of small "rotating toothed frames" are fitted to the radial arms of a circular frame weighted as above by a box supported on a roller running on the frame, "thereby producing a kind of sun and planet motion of the central and surrounding frames."

3. Similar small frames may be carried by a triangular frame, the hinder part of which can be detached, and the front portion used separately as a cultivator. Fixed teeth may also be carried by the frame.

4. Two concentric harrows are mounted on the same spindle, one above the other, the spindle being slightly curved so as to incline the two harrows in opposite directions.

5. A fixed arm carrying a single tine may be fitted on the lower end of the spindle, at right angles to the draught bar, and this arm partly supports the harrow on that side, and tilts it over in an inclined direction.

[Printed, 10d. Drawing.]

A.D. 1850, December 22.—No. 2915.

OLLIVIER, LOUIS BERTHARD. — (*Provisional protection only.*)—"Ploughshares, hoes, and other similar cutting parts of agricultural implements."

The following is the whole Provisional Specification:—

"These improvements consist in providing the shares or cutting blades of ploughs, hoes, scarifiers, or other similar agricultural implements with a moveable cutting edge or knife of steel, or other suitable material, and which is to be fixed to the share by screws, rivets, or other suitable means, so as to allow of replacing the same and providing the share with another cutting edge when required."

[Printed, 4d. No Drawings.]

1860.

A.D. 1860, January 3.—No. 11.

OLLIVIER, LOUIS BEETRAND. — (*Provisional protection only.*)—Ploughs.

The inventor says :—" On the mould board or breast of the  
" plough, which is made of cast iron, I adapt a movable steel  
" cutter or share, and on the coulter a movable cone, which  
" in turning throws aside all the weeds and roots that might  
" otherwise obstruct it." This cone is fitted on the stem of  
the coulter, immediately below the plough beam. There is a  
" hook screwed to the plough beam & sliding in a groove or  
" slot in the discharger " or cone, " which prevents the said  
" weeds and roots from obstructing the space between the  
" discharger and the beam." " For ploughs which do not  
" have any coulter, the cone piece " may be adjusted in the  
" fore part of the mould board." " At the lower part of the  
" cone may added a cog-wheel, which, by its contact with, and  
" friction on the ground will impart a rotating motion to the  
" discharger."

[Printed, &c. Drawing.]

A.D. 1860, January 24.—No. 179.

CARTER, JOSEPH TERRELL. — " Machinery for tilling the  
" soil."

An engine and boiler are mounted on a frame supported on  
wheels at back and front. The engine is moveable, and has  
wheels of its own on which it can be transported from place to  
place. At the back of the frame are a number of " twisted  
" shares or blades inclined and curved similar to the turn-  
" furrow of ordinary ploughs ;" these are mounted on spindles  
rotated by the engine through suitable gearing. Rakes and  
cultivators are connected to the ends of the share spindles, so  
that they follow the implement. A harrow and a roller may also  
be attached on behind " Stamps " may be fitted to work up  
and down in front of the ploughs. These are actuated each  
by a small steam cylinder. The shares may have " lateral as  
" well as rotary motion " to prevent any of the ground re-

" been hauled from one headland to another, is moved a distance sideways equal to several widths of the plough, and is then hauled back to the first headland." This sideways motion of the plough is to be accomplished by a windlass anchored to the ground by spikes. Pulleys are anchored at the headlands in suitable positions. Both traction ropes are connected to the front of the plough.

Some improvements in winding drums are also described.

[Printed, 8d. Drawing.]

A.D. 1859, October 13.—No. 2335.

HUNTER, JAMES.—"Apparatus for ploughing or cultivating land."

The apparatus consists of a steam ploughing engine. A frame has mounted on it in front the boiler and engine. Behind these is a transverse shaft with four wheels thereon carrying tines. Of these one is a chain wheel, and is driven from a pulley on the axle of one of the bearing wheels; this wheel is keyed on the shaft. The other three are loose on the shaft so as to be capable of being set at any distance apart. They are held in position by cross screws and nuts, holding all the wheels together. The outer pair of wheels have broad peripheries. The bearing wheels are behind these. They are fitted so that they can be raised and lowered by a rack and pinion operated by the engine, so as to allow the weight of the whole to rest on the tine wheels and on the plough frame behind. This frame carries as many ploughs as there are tine wheels, the latter being intended to slice the land in parallel lines, the latter to turn it over. The ploughs are fixed by screws in slotted transverse bars, so that they may be adjustable to correspond with the tine wheels. When the bearing wheels are off the ground one of them serves as a fly-wheel, being keyed to the shaft for that purpose; the other is loose on the shaft.

[Printed, 10d. Drawing.]

A.D. 1859, October 13.—No. 2336.

BURGESS, WILLIAM.—"Reaping and mowing machines."

1. A method of backing the machine. A ratchet worked by a pall connected to a hand lever is applied to turn the running

wheel in the reverse direction by acting on an internal spur wheel on the running wheel or otherwise.

2. The divider is formed of an ordinary finger by affixing thereto a curved bar which extends backwards from the point of the finger.

[Printed, &c. Drawing.]

A. D. 1859, October 15.—No. 2855.

ECHARD, JOSEPH.—(*A communication from Mr. Estlinbaum.*)—"Apparatus for ploughing and sowing."

A hopper is mounted on a frame with a pair of wheels. It is divided into compartments, and a shaft passes along it, on which is a rotary stirrer in each compartment. There is an aperture at the bottom of each compartment covered by slides. Below the hopper is a frame, pivoted to the front of the carriage frame, and capable of being raised or lowered by a lever working along a quadrant, or a pinion engaging in a segmental rack. Shares are fixed at the back of this frame, corresponding in number with the compartments of the hopper. The stem of each share is hollow, so as to form a tube down which the seed passes, and into the top of this tube a bent tube with a funnel is inserted. A sort of two-pronged fork is pivoted to the stem of the share, so that the points of the prongs rest on the ground behind the share. For clearing the shares a fork may be fitted behind each share, and these forks may have a jogging motion given them from the axle. These shares can be moved, and the corresponding discharge holes in the hopper closed. When the nature of the ground requires it, the seed tube may be shifted from the front to the back of the share, so that it delivers the seed on the ground before the share, the latter then carrying the seed and soil to the sides, and leaving a furrow between which serves as a drain.

[Printed, &c. Drawings.]

A. D. 1859, October 31.—No. 2478.

BROWN, ISAAC.—"Treatment of growing crops."

The invention consists in a method of supplying water and liquid manure to the crops, and also in a method of supplying heat to the same. A system of pipes is laid down over the



farm, &c., connected with tanks supplied with water, and fitted with perforated distributing pipes. Any suitable fertilising agent may be mixed with water in a separate tank, and the solution added to the main supply tank. Steam may also be supplied through the same or a similar set of pipes, this portion of the invention being "more particularly applicable to market gardens and horticulture."

[Printed, 4d. No Drawings.]

A. D. 1859, October 31.—No. 2484.

CICHOWSKI, ROMAN.—(*Letters Patent void for want of Final Specification.*)—Ploughs.

The following is the whole Provisional Specification :—

"My invention has for its object the formation of the mould board, and the combination of the same with the share, so as to cause the plough to operate on the ground, raise, turn over, and deposit the furrow slices in succession at an angle of 45 degrees, or thereabouts, to the plane of the ground with diminished friction and resistance therefrom. For this purpose the share and mould board are formed and combined so as to constitute one continued instrument or operator without any cavity between them. The outer surface of the mould board is formed according to a spiral with a pitch determined by the arc through which the furrow slice has to travel in passing from its original horizontal position to that in which it is deposited, divided by the length of the plough that is, the length of the share and mould board taken together) minus half of the length of the share, that is, the furrow slice having to pass through an arc of 135 degrees, or thereabouts; this number divided by the length of the mould board added to half that of the share will yield a quotient which is the pitch of the spiral according to which the mould board is formed. The after part of the mould board beginning from or near the point which causes the furrow slice to assume a vertical position is also formed with a curve or bend which leaves a portion of the furrow slice in contact therewith in such a manner as to diminish the friction and resistance of the same to the action of the mould board. In other respects the plough may be varied."

[Printed, 4d. No Drawings.]

A.D. 1859, November 4.—No. 2511.

**KOCH, LOUIS.**—"Moving tread power."

This "mechanism for obtaining motive power" is applicable to reaping and mowing machines. It is described as applied to a small machine worked by a man pushing it from behind in the manner of a wheel-barrow. The cutters are rotary curved knives, arranged radially on vertical spindles. A pair of pulleys are mounted loosely on a transverse shaft, so that by means of ratchets they impart motion to the shaft when turned in one direction, while springs are arranged to wind up the drums in the other direction without turning the shaft. On each pulley a band is wound, the end of which trails on the ground. The man pushing the apparatus treads on one of the bands, and thus unwinds the band off the pulley, thereby revolving the pulley. His next step he treads on the second band, letting go the first, and so on. A continuous motion is thus given to the shaft, and this is transmitted in any suitable way to the cutters. The cutting edges of the knives are "on the outer circumference."

[Printed, &amp;c. Drawing.]

A.D. 1859, November 12.—No. 2568.

**BURGESS, WILLIAM.**—"Mowing and reaping machines."

The finger beam, &c. is hinged to the hinder end of a bar extending from front to back along the side of the machine, and pivotted to the front of the frame. The hinder end of this bar is supported by a lever with a small wheel on its lower end. By altering the angle of this lever, the cutters can be raised or lowered. The lever is held in position by a catch engaging with one or other of the teeth of a rack. The machine can be backed by the arrangement described in No. 2336, A.D. 1859. When the finger bar is turned up on its hinge, it can be held up out of the way by a hook near the driver's seat.

[Printed, &amp;c. Drawing.]

A.D. 1859, November 19.—No. 2620.

**LE PONTOIS, AUGUSTE HONORÉ.**—"Machines for distributing seed and manure."

The manure is contained in cylinders, revolving on a horizontal shaft. Round the interior circumference of each

cylinder are fitted a number of tubes "so arranged that as the box revolves these tubes become filled with manure in one position, but when in the opposite the contents of the tubes are deposited in the earth through apertures formed in the box for that purpose; the apertures through which the manure passes lead first into boxes or trays arranged around the exterior circumference of the box." Above the cylinders are hoppers containing seed. These have openings underneath, covered with slides. On the outside of the manure cylinders are teeth, which open the slides, and cause a portion of seed to pass down and be mixed with the manure in a tube below. The lower opening of this tube is closed by a valve which, when the seed and manure have been sufficiently mixed, is opened by one of the cylinder teeth, and the contents are discharged on to the ground. Shares are arranged to cut furrows, or a conical edged wheel or wheels may be used. There are also rakes to cover in the seed. These, as well as the hoppers, &c., are arranged so as to be adjustable transversely, that the distance between the furrows may be regulated. The apparatus may be constructed like a wheelbarrow, and be worked by one man, there being two wheels, one of which cuts the furrow and drives the apparatus, the other being used in turning, for the machine to rest on.

[Printed, 10d. Drawing.]

A. D. 1859, November 30. — No. 2706.

SAMUELSON, BERNARD, and MANWARING, WILLIAM. —  
"Reaping and mowing machines."

1. The knife is made to travel at each stroke a greater distance than from one finger to the next. Any suitable arrangement of the driving gear may be used to effect this, and the fingers may be any suitable distance apart, so long as the knife "shall travel at least from the right edge of one of the guards across an intermediate guard to the left edge of the next guard, and vice versa."

2. The back edge of the knife bar is roughened to prevent clogging; it is preferably of steel. The front edge also may be similarly treated.

3. "Intermediate shoes or dividers" are set along the finger bar. They may be formed like the fingers, but longer, and

there are bars extending from the point sideways and backwards, for the purpose of dividing tangled crops. The bars are not to extend further back than the knife. The dividers may be of soft iron, so that they can be bent as required; also they may be formed with a socket to fit over the point of a finger, so as to be removeable. These guards may be jointed, so that they yield to any obstacle.

4. In order to prevent the knives or fingers running into the ground, the inventor says "I thicken such beam" [the finger bar] "from below, either by a projection from the end divider, or otherwise, behind (and in the part within the cutting reach of the knife)."

[Printed, 1s. Drawing.]

A. D. 1859, December 5.—No. 2749.

BENN, JULIUS.—"Drills."

The description is not very clear, and there are no explanatory drawings. The principal part of the invention seems to refer to a method of delivering seed and manure by means of endless bands so mounted that one side passes through the hopper and through apertures in the bottom, or by discs rotating with part of their circumference in the hopper. The discharge apertures are lined with bristles or india-rubber. The seed, &c. is delivered "from the box into the usual tins" "direct from the side of the box into the bottom." There is a slide and screw for regulating the amount delivered. The endless bands may be "chains, cords or straps;" they may be used separately, or in continuation with discs, or the latter may be used alone. The discs are to be fixed on an axle at the side "of the box near enough to revolve with nearly half their diameters inside the seed or manure box."

[Printed, 4d. No Drawings.]

A. D. 1859, December 8.—No. 2778.

SPENCE, WILLIAM.—(*A communication from Sidney S. Hogle.*)—"Rotating harrows."

Several modifications are described, all concerned with harrows that rotate about vertical axes.

1. A single circular frame carrying teeth is mounted on a central vertical spindle to which a draught bar is attached. A

heavy roller is fitted at the extremity of a radial arm so that it may run on the outer ring of the frame and thus depress one side more than the other, so as to drive the teeth on that side deeper in the ground, and thereby give the required rotary motion. Or the weight may be simply carried by a radial arm at right angles to the draught bar, instead of running on the frame.

2. A number of small "rotating toothed frames" are fitted to the radial arms of a circular frame weighted as above by a box supported on a roller running on the frame, "thereby producing a kind of sun and planet motion of the central and "surrounding frames."

3. Similar small frames may be carried by a triangular frame, the hinder part of which can be detached, and the front portion used separately as a cultivator. Fixed teeth may also be carried by the frame.

4. Two concentric harrows are mounted on the same spindle, one above the other, the spindle being slightly curved so as to incline the two harrows in opposite directions.

5. A fixed arm carrying a single tine may be fitted on the lower end of the spindle, at right angles to the draught bar, and this arm partly supports the harrow on that side, and tilts it over in an inclined direction.

[Printed, 10d. Drawing.]

A.D. 1859, December 22. —No. 2915.

OLLIVIER, LOUIS BERTRAND. — (*Provisional protection only.*)—"Ploughshares, hoes, and other similar cutting parts "of agricultural implements."

The following is the whole Provisional Specification:—

"These improvements consist in providing the shares or "cutting blades of ploughs, hoes, scarifiers, or other similar "agricultural implements with a moveable cutting edge or "knife of steel, or other suitable material, and which is to be "fixed to the share by screws, rivets, or other suitable means, "so as to allow of replacing the same and providing the "share with another cutting edge when required."

[Printed, 4d. No Drawings.]

1860.

A. D. 1860, January 2, —No. 11.

OLLIVIER, LOUIS BERTRAND. — (*Provisional protection only.*)—Ploughs.

The inventor says :—"On the mould board or breast of the plough, which is made of cast iron, I adapt a movable steel cutter or share, and on the coulter a movable cone, which in turning throws aside all the weeds and roots that might otherwise obstruct it." This cone is fitted on the stem of the coulter, immediately below the plough beam. There is a hook screwed to the plough beam & sliding in a groove or slot in the discharger or cone, "which prevents the said weeds and roots from obstructing the space between the discharger and the beam." "For ploughs which do not have any coulter, the cone piece" "may be adjusted in the fore part of the mould board." "At the lower part of the cone may added a cog-wheel, which, by its contact with, and friction on the ground will impart a rotating motion to the discharger."

[Printed, 6d. Drawing.]

A. D. 1860, January 24, —No. 179.

CARTER, JOSEPH THRELFALL.—"Machinery for tilling the soil."

An engine and boiler are mounted on a frame supported on wheels at back and front. The engine is moveable, and has wheels of its own on which it can be transported from place to place. At the back of the frame are a number of "twisted shares or blades inclined and curved similar to the turn-furrow of ordinary ploughs;" these are mounted on spindles rotated by the engine through suitable gearing. Rakes and cultivators are connected to the ends of the share spindles, so that they follow the implement. A harrow and a roller may also be attached on behind. "Stamps" may be fitted to work up and down in front of the ploughs. These are actuated each by a small steam cylinder. The shares may have "lateral as well as rotary motion" to prevent any of the ground re-



maining unbroken ; also the spindles carrying the shares may be raised and lowered, but no method is described for effecting either of these operations. The engine may be a special sort described.

(Printed, 1s. 4d. Drawings.)

A.D. 1860, January 27—No. 213.

BRIGHAM, JOHN.—(*Provisional protection only.*)—"Apparatus for sowing or depositing seeds in land."

There are two pair of seed chests, one pair at the back of the carriage frame and the other pair hinged to the front of the frame so that they "extend out laterally beyond the chests at the back, and in this manner twice the breadth of land is sown at one operation." By having the front pair hinged to the frame they can be turned over thereupon for convenience of transport. The seed wheels of both pair are driven by belts from the axle of the running wheels. They may all be thrown out of or into gear simultaneously by a clutch.

[Printed, 4d. No Drawings.]

A.D. 1860, February 7.—No. 327.

HALL, COLLINSON.—"Steam tilling machinery and apparatuses."

1. The pulley over which the traction rope passes is mounted on a wheeled frame which traverses along the headland. Rollers mounted on the frame travel on a rope stretched along the headland and secured by "screw anchors," or stakes with screws formed thereon by which they are driven into the ground. The rope is screwed at each end to one of these, and others are set at intervals, the rope being secured to them by clamps which are moved to allow the pulley and its carriage to pass. The clamps are formed of two pieces with an internal hollow corresponding in shape to the rope. The two halves are secured by screws. Between every two anchors a piece of tubing is placed over the rope, to keep it stiff, and it is on this that the rollers of the carriage travel. It is preferred to mount a rope, pulley, &c. at both sides of the field, and to place the engine in the middle of the field.

2. To prevent kinking, swivels are fitted at intervals on the wire traction ropes. The ends of the rope are brazed into the sockets of the swivels, or secured by cross pins.

3. An improved winding drum is described.

[Printed, 10d. Drawing.]

A. D. 1860, February 8.—No. 334.

MOODY, CHARLES PETERS.—(*Provisional protection only.*)

“Improvements in carrying, supporting, and shifting engines  
“used in ploughing and other agricultural operations, and in  
“apparatus used therein.”

“At both ends of a field or space over which an engine is to  
“travel and draw at its side ploughs, harrows, or other imple-  
“ments” there is laid down “a platform along which the  
“sleepers and rails for supporting the engine are to be  
“drawn.” “The platform itself is drawn along after the  
“engine has left the rails which it supports by winding up a  
“rope attached to an anchor.” Between the two platforms a  
portable railway is laid down. This is made in lengths, and  
is moved either in parts or all at once, by cords attached to it  
at different parts of its length, and led round fixed pulleys  
back to a windlass at the centre of the railway. Guides may  
be fitted on which the railway slides. As soon as the engine  
reaches one of the platforms the railway and the opposite  
platform are shifted, and then the engine is traversed along its  
platform. The platform consists of an iron frame with  
winding gear thereupon for the purpose of effecting the  
traverse.

[Printed, 4d. No Drawings.]

A. D. 1860, February 11.—No. 380.

HARWOOD, WILLIAM.—“Machinery for reaping and mow-  
“ing.”

Improvements on No. 2759, A. D. 1857.

1. To raise the finger bar and cutters a wheel on each side,  
or one at the centre of the machine, is mounted on brackets  
projecting from a cross bar, so that by turning this bar on its  
axis, by a lever or otherwise, the wheels are pressed on the  
ground and the frame of the machine raised.

2 To vary the speed of the cutters pulleys of different sizes with endless bands or wheel gearing suitably arranged may be employed.

3. The spiked delivery bands described in the previous Specification are driven by bands on rollers at the rear end of the machine, the driving roller of the pair being on a shaft driven from the main running wheel. One end of this shaft has a universal joint, and the other end is adjustable so as to tighten the driving band. This shaft may pass across the platform and have spikes thereon to assist the delivery of the crop.

4. In cutting light crops a board is attached to the frame behind the travelling wheel; this board receives the crop and carries boys who stand thereon to bind the crop. It may be supported on wheels or hung from the frame.

5 To deliver the crop at the side, the bands, &c are removed, and the crop is received on a board behind the cutters. A rotating rake works over this board, the heads carrying the teeth being pressed against the board by springs.

6. The divider is fitted with an endless spiked band which travels along it to clear the crop therefrom.

7. To keep the finger bar close to the ground the front of the frame is connected to the shafts by springs which raise the front, and thereby depress the back and the cutters. Or the back of the frame may be connected to the hinder ends of the shafts by springs which depress it. When this arrangement is not required a screw is used to raise and lower the front of the frame.

8. A second reel to raise laid corn may be used as well as the one described in the previous Specification. This reel may have curved teeth thereon.

9. Instead of joining the connecting rod to the cutter bar it is joined to a bracket above the cutters working in guides. In order to enable a long connecting rod to be used, the "frame" carrying the crank axis which gives motion to the connecting "rod" is jointed to the main frame so that it can be turned up thereon.

10. To keep the knives to the finger bar as they become worn, brackets are attached "at intervals to the finger bar," and through them bracket screws pass, the ends of which "press on an iron bar running parallel to the finger bar."

11. The driver's seat is mounted on a bar pivotted to the frame so that the seat can be set on either side and clamped there. The seat also turns on the end of the bar. Or the bar carrying the seat may be set in a socket on either side of the machine as required.

[Printed, 2s. 6d. Drawings.]

A. D. 1860, February 13.—No. 386.

**GREEN, JOHN.**—Manure drill.

A cylindrical box is mounted on a spindle between a pair of wheels. It is perforated with rows of holes, each row having a perforated sliding plate by which the holes can be wholly or partly closed. These slides are connected together, and operated simultaneously by a lever. The box is divided into compartments. Below the box is hung loosely a hopper with inclined sides, arranged to distribute the manure which falls into it from the revolving cylinder, either broadcast or in drills of any suitable width apart. The machine may be drawn by horse or a man. It may be mounted on a single wheel if preferred.

[Printed, 8d. Drawings.]

A. D. 1860, February 25.—No. 516.

**GILLESPIE, JAMES, and GILLESPIE, JOHN.**—"Reaping and mowing machines."

The principal improvements refer to the delivery apparatus. There are slots across the platform, and rakes are mounted to work through these slots, being actuated by cranks so that as the teeth pass to and fro they are alternately raised above or lowered under the platform. In each slot there is a pair of rakes. "The uppermost and hindermost pair of spiked bars or rakes is by preference made longer than the others, so as to carry round the ear ends of the grain and lay the grain cross-ways." In mowing machines there is a pair of rakes "as close behind the cutters as possible."

Besides this the following improvements also are mentioned. Antifriction rollers are mounted behind the knife. The fingers are serrated near their bases. The reel is formed with "smooth round rods" in place of broad flat vanes. For mowing a reel with spiked bars is used, and the arms are fixed

by wedges, so as to be adjustable. "The spikes are curved  
 "so as not to throw up the grass when raking it on to the  
 "platform, the reel being adjusted so as to work very nearly  
 "in contact with the fingers."

[Printed, 10d. Drawing.]

A. D. 1860, February 25.—No. 518.

DENTON, HENRY RICHARD JOHN.—(*Provisional protection only.*)—"Hay rakes, horse rakes and similar agricultural  
 "implements."

The object is to render hay rakes automatic so that they  
 may be raised at suitable intervals. There is "a spindle  
 "under the upper part of the tines, or in connection with  
 "parts attached thereto, so that by raising the spindle the  
 "tines are also raised." "This spindle is mounted on levers  
 "connected by universal joints or otherwise with the framing  
 "or main axle of the machine. The extent of motion in the  
 "levers is adjusted by suspending chains or quadrants  
 "and pins." This spindle is driven by endless bands  
 or gearing from the main axle. It "carries one or two or  
 "more levers or legs." These revolve with the spindle  
 "until their ends or feet come in contact with the ground,  
 "and compel the spindle to rise until the legs are perpendicular,  
 "when it again begins to descend until the legs leave the  
 "ground." This apparatus may be thrown out of gear,  
 and the rake used in the ordinary manner, the spindle being  
 "moved or thrown over by hand so as to bring the leg or  
 "legs into action." The legs may be jointed, and of various  
 lengths if preferred. The invention is applicable to rakes for  
 "collecting hay or corn, or for collecting weeds or for raking,  
 "cultivating or scarifying the ground."

[Printed, 4d. No Drawings.]

A. D. 1860, February 25.—No. 523.

BOYD, JAMES EDWARD.—"Transmitting motive power from  
 "certain parts to certain other parts of lawn-mowing, grass-  
 "cutting and other agricultural, horticultural and farming  
 "machines."

The invention appears to be applicable to lawn mowers  
 principally, but the patentee claims its application to "all

"lawn-mowing, grass-cutting, reaping, and other agricultural "horticultural and farming machines" which may be improved by being made noiseless.

1. The spur-wheels and pinions are covered with india-rubber or other suitable soft material.

2. The grass-box is fitted on india-rubber supports.

3. The cut grass is guided into a bag behind which is removed as soon as full.

4. The knives are larger, so as to throw the cut grass farther.

5. The shafts curve upwards.

6. The cutter spindle is tightened up by a set screw and cone at each end. The cutter consists of an archimedean screw.

7. The "curved back or screen" is moveable.

8. Lawn mowers are made with vibrating knives formed of a corrugated blade working through fingers. The fingers are "made hollow" and "cast or otherwise made in sections." "Endless bands of steel" may be used "furnished with saw" or other shaped teeth or cutters, and revolving and working "by means of an eccentric" or otherwise; "the grass or grain or other crops will be made to come between the teeth or cutters on the bands, which working in opposite directions "to each other" operate on the crop.

[Printed, 4d. No Drawings.]

A.D. 1860, March 5.—No. 605.

HOWARD, JAMES.—Horse rakes.

The object of the invention is to enable the lever handles and the depressing bar, which acts on the heads of the tines to raise them when required, to balance without the lever being held by a catch. For this purpose, the handle is pivotted to a radius bar pivotted to the front of the frame, and it has on it a short rigid arm pivotted to a bracket arm attached to the depressing bar. The effect of this arrangement is that the depression of the lever handle raises the tines and holds them raised, the weight of the lever counterbalancing that of the depressing bars.

Printed, 10d. Drawings



A.D. 1860, March 12—No. 663.

ASHBY, THOMAS WOODHOUSE, and YORKE, THOMAS.—"Hay-making machines."

The object of the invention is to prevent the pinion which transmits rotary motion to the axle of the tine cylinders from working itself out of gear. On the fixed shaft is mounted a pair of sliding tubes, connected together at their inner extremities by "a link motion, the centre pin of which has its bearing in "a socket in the fixed shaft." "The outer ends of each of "these tubes forms a hollow bearing for a spur pinion." These pinions take into the driving wheels on the opposite side, and transmit motion to the tine cylinders, the boss of each pinion being fitted with a feather, which takes into a groove in the hollow axle of the tine cylinder. These "cylinders are "mounted loosely on their respective sliding tubes, so that "they are free to rotate thereon when the spur pinions are "locked into their axles. This locking is effected by the "operation of a hand lever connected to one of the sliding "tubes. By rocking this lever, the pinion carried by the "sliding tube, to which the lever is attached, will be thrown "into gear with its driving wheel, and through the link "motion connection the pinion on the other sliding tube will "be drawn into gear with its driving wheel, and thus the rota- "tion of the tine cylinders will be effected. A reverse move- "ment of the lever will instantly throw them out of action. "Instead of using the link motion to slide the pinions in and "out of gear, the like effect may be obtained by forming a "worm-like groove in each of the sliding tubes, and causing "studs on the solid shaft that supports the weight of the tine "cylinders to project therein. By giving an axial motion to "this shaft, the studs acting on the edges of the slots will "cause the tubes, together with the pinions which they carry, "to slide nearer to or farther from each other as desired." To prevent the travelling wheels from being clogged with hay, there are at each side of the machine "guards formed of up- "right iron rods, having diverging branches descending from "their points."

[Printed, and Drawing.]

A.D. 1860, March 20.—No. 725.

LAW, THOMAS.—(*Provisional protection only.*)—"Reaping  
"and mowing machines."

The cutter consists of "an endless belt of steel, supported on  
"pulleys placed at the four corners of a rectangular frame,  
"the pulleys turning on horizontal axes." The frame is con-  
nected to the main frame of the machine, "so that it stands in  
"a vertical position, and the frame is of sufficient height for  
"the upper part of the frame to be above the top of the crop  
"to be cut." "The part of the belt between the two lowest  
"pulleys passes between slots on stationary fingers," "the  
"points of the fingers projecting beyond, and the top of the  
"fingers overlapping the front edge of the belt." The belt is  
preferably formed of a strip of steel about three inches in width  
with the ends rivetted together. The cutting edge may be  
plain or serrated. It may rub against "a stone or other  
"sharpening apparatus so placed, that one or other of the  
"sides of the serration (if any of the belt may be sharpened  
"whilst the machine is in motion." The back edge of the  
belt may be rivetted to an endless band of leather or other  
material "of less width than the band of steel, the leather or  
"other band being made to slide in suitable grooves in the  
"fingers, to prevent the edge of the band getting out of its  
"proper position." The cutting apparatus may also be com-  
posed of an endless belt of leather "having a number of knives  
"of a V or other form rivetted to its exterior, the rivets pass-  
"ing through the centre of the knives, so that the belt may  
"pass readily over the rollers." To deliver the crop, there  
are "two or more spirals made of bar steel or other material,  
"bent into an open spiral form, the ends of the rods being  
"supported in bearings, so that a rotary motion may be given  
"to them, the spiral bars are placed behind the cutter, and  
"parallel with it, and the under sides of the spirals rest on a  
"flat stationary board." The crop as it is cut falls on to the  
"spiral bars," which deliver it at the side of the machine.

[Printed, &c. No Drawings.]

A.D. 1860, March 26.—No. 783.

JOHNSON, JOHN HENRY.—(*A communication from Jean  
Baptiste Vin.*)—"Improvements in shaping metals, and in  
"the machinery or apparatus employed therein."

Among the articles enumerated as capable of being manufactured by this process, "the teeth or tines of agricultural implements" are mentioned. Rollers of special shape for forming trowels, shovels, &c. are described, but there appears to be no allusion to any machinery for the manufacture of any article connected with the present series. It is stated that "the main feature which distinguishes this system of rolling metals" is "that the material presented at one side of the rollers returns in place of passing to the other side." "Thus result is obtained by the eccentricity of the rolls which admit of the article being introduced between them at the time when their surfaces are furthest apart and which then grip the article as their surfaces approach, and roll it and force it forwards towards the attendant."

[Printed, &c. Drawing.]

A. D. 1860, March 29.—No. 815.

SMITH, NATHANIEL, and SMITH, ROBERT.—"Hay-making machines."

The running wheels and spur driving wheels are separate, and those at each end both work on the same stud axle which is fitted to the head of the machine. The running wheels are secured by binding nuts, so that they can be readily removed. The tines are mounted in pairs on short tine bars carried by radial arms tubular or not. They are arranged diagonally, instead of in parallel rows. Each tine bar is kept in position by a spring, fitted on the arm next it, the end of the spring carrying a "shoe" of such a shape as to allow the tine to yield, and then bring it back into position. The "tail" of each spring bears against the spring next to it, to assist its action. The tine shaft is hollow. The tine cylinders are raised and lowered by a quadrant and pinion. To shift the tine pinions laterally, and thereby throw them out of gear, "a pinion" (mounted within the hollow tine shaft) is made to gear into "a pair of racks contained therein, and which project out at opposite ends of the hollow shaft, and are bent round to envelope respectively the grooved bosses of the sliding or "tine barrel pinions." "A lubricating box is adapted to each head of the machine" and the pinions are mounted on hollow spindles with a suitable opening at the end covered by

a lid. Through this the lubricant is introduced and it passes through a hole in the box to the bearings of the pinion.

[Printed, 10d. Drawing.]

A. D. 1860, March 30.—No. 825.

**CROSSKILL, ALFRED, and CROSSKILL, JAMES GAWAN.**—  
“ Reaping and mowing machines.”

The improvements are applicable to the class of machines pushed by horses from behind as well as to those drawn in the usual way. They are as follows:—

1. A gathering rake for delivering the corn to either side is described. The stem of the rake is horizontal, and its hinder end is pivotted to a piece sliding longitudinally in guides. A pin on the stem passes through a slot in a crank arm on a vertical shaft driven from the main shaft. On the same pin is a friction roller running in a guide of approximately triangular form and set horizontally. The effect of this is that the rake moves over three sides of a triangle, that is to say, it is pushed diagonally forward, sweeps across the platform, and is drawn diagonally back. A shield is fitted across the platform, below which the rake is retracted, except when it is traversing the platform. For machines drawn by a horse at the side the arrangement is so far modified that the guide is set vertically, and the rake rises and falls instead of being drawn backwards and forwards. Several small modifications are described. The rake may be operated by a pinion traversing a rack or an endless chain working over three rollers instead of by the crank above described. Also the manner in which its hinder end is guided may be varied. The stem may slide in a turning collar, or be pivotted to a bar having a sort of parallel motion.

2. The divider has a reciprocating motion given to it by a crank driven from the operating parts of the machine.

3. Motion is given to the knives by spurs, instead of bevel gearing, “by employing a right angle or bell crank lever for changing the motion.”

4. In the Provisional Specification reference is made to a method of throwing the working parts out of gear by means of a ratchet and pawl connected to the driving wheel. No further allusion to this appears in the Final Specification.

[Printed, 3s. 6d. Drawings.]

A.D. 1860, April 11.—No. 907.

BURRUP, JOSEPH. — (*Provisional protection only.*) —  
“ploughs.”

The following is the whole Provisional Specification :—

“My invention consist in a means of adapting a general purpose plough to perform the work of a parer or surface-paring plough when required. I remove the share when the plough is required to act as a parer, and fit in its place what I term a knife-holder, which terminates in front in a broad curve. A flanged recess is formed in the under part of the front for the reception of a paring knife or blade secured by screws or rivets.”

[Printed, &c. No Drawings.]

A.D. 1860, April 13.—No. 924.

BAMLETT, ADAM. — “Reaping and mowing machines.”

The improvements relate principally to “Hussey’s” machine, and are as follows :—

1. The driving wheel is mounted in bearings which can be raised and lowered to regulate the height of the cutters.

2. The draught pole is fixed to the under side of the frame, so that the pull may be “more in an upward direction.”

3. A lever is fitted to the cutters to raise them from the ground.

4. “Instead of overhanging the pinion that receives motion from the driving wheel on its shaft,” the pinion is loose, and slid in and out of gear by a clutch. Or the pinion may be fast on the shaft, and the bevel wheel driven thereby moved as required.

5. The spur wheel and pinion are covered in with sheet metal to prevent clogging.

6. The hand rake has “a cross or right-angled handle about the middle of its shaft.”

7. To enable the reaper to be used as a mower, the finger bar, platform, and travelling wheel are removed, and another set of cutters fitted on in the opposite direction. The machine then travels in the opposite direction.

8. The finger bars are “ribbed,” of a T or X section. One end of the bar has “a piece projecting backwards” by which it is fixed to the frame. The side of the bar to which the

knives are attached is planed. Or the inventor may "fix solid fingers to the bar, and cut out the slots of the fingers." The fingers are "of great depth below the knife."

9. This, as well as the following (10), is an improvement on No. 1148, A.D. 1859. There is a "swing bar or board which may be acted on by a spring, or fixed and placed over one of the driving strap rollers of Specification of Patent afore-said," "to hold the butts of the corn while the straps are carrying the heads round to form the corn into a swathe." There is also "a vertical fluted roller to push the corn back-wards the breadth of the finger bar."

10. The travelling wheel, instead of being mounted in a castor frame, is mounted "on a bar or plate, which is attached to the framework at each end by horizontal links of different lengths, so that in turning the machine the wheel can assume positions in which it will pass over the ground without cutting into it."

11. A "sledge for drawing the machinery sideways through narrow gates," is formed of three pieces of wood, two of which are jointed to the third. This is placed under the bearing wheel, the two free ends of the pieces being connected by a chain, the drag on which draws them together, and forces them under the wheel.

12. The delivery rake is worked by a crank on the main axle which vibrates a bell crank lever carrying the rake. This works radially over a segmental platform. The crank can be clutched on the axle or set free therefrom by a lever worked by the driver's foot. The rake is caused to rise and fall, also to turn on its own axis by suitable stops thereon striking against fixed pieces on the frame. A bell may be arranged to give notice of the rake having reached the end of its traverse.

13. There is "a toothed segment on the end of the draught pole, into which is geared an endless screw mounted on the frame, its object being to regulate the cutting height of the knife."

14. The "lever carrying the trucks between the main driving cams" (described in No. 1148, A.D. 1859) is locked "with the trucks disposed in the bottoms of the fixed cam, and so as to permit the free rotation of the running wheel when disengaged."

[Printed, 1s. Drawing.]



A.D. 1860, April 13 —No. 928.

**BURGESS, WILLIAM.**—(*Letters Patent* *in* *and* *for* *want* *of* *Final Specification.*)—"Mowing and reaping machines."

The following is the whole Provisional Specification :

"The object of my invention is to insure the better working  
"of mowing and reaping machines over inequalities in  
"the ground upon which the machines may be travelling.  
"To effect this, I employ an inner frame which carries the  
"axle of the main driving wheel, and I connect this frame  
"to that which carries the gearing to work the knife by means  
"of axis on a line with the second motion spindle or that  
"which derives its motion from teeth inside of the main  
"wheel. This arrangement admits of the driving wheel rising  
"or falling without the gearing frame, and consequently the  
"knife rising and falling with it."

[Printed, *ad.* No Drawings.]

A.D. 1860, April 18.—No. 974.

**FOWLER, JOHN, junior, WORBY, WILLIAM, and GREIG, DAVID.**—(*Partly a communication from Messrs. Schultart and Hesse.*)—"Tilling land," &c.

1. A method of actuating diggers or other tilling instruments by means of the traction rope is described. Both ends of an endless rope passing round drums on the headlands are connected to the implement in the usual way. The other end of the endless rope is taken round a drum mounted on the implement, and motion is imparted from this drum by suitable gearing to the diggers, &c. Or the rope may simply be taken round the drum, and motion be thence imparted to the bearing wheels of the implement, a separate carriage supporting a drum for winding up the slack. By this means the rate of travel of the implement can be varied without affecting the speed of the rope.

2. Harrows are worked by steam power. The traction rope is attached to an axle mounted on a pair of wheels. To this axle the harrows are connected by drag chains or links. The drag chains are fitted with eyes sliding on bars fixed on the top of the harrow. When the implement has reached the end of a bout, the motion of the traction rope is reversed, the eye slips along the bar, and the harrow is drawn in the

other direction, without its being turned. The axle is telescopic so that the number of harrows attached thereto may be varied. Suitable steering apparatus is fitted to the axle and wheels. Similar apparatus may be applied to land rollers, &c. as well to harrows of different sorts.

3. In order to keep the return rope tight, two drums are mounted on the same vertical shaft, on each of these one end of the rope is wound which becomes alternately the hauling and return rope. A parallel shaft driven by the engine has on it a pair of pinions running loose thereon, but capable of being clutched thereto. These pinions engage with spur wheels on the drums, so that either drum can be driven by clutching its pinion to the shaft. On the same shaft are smaller loose pinions sliding thereon and engaging with other spur wheels on the drums. Friction straps round the bosses of these pinions are connected to the clutches. The effect of this is that the giving off drum is driven at a lower speed than the winding drum, and the strain of the rope causes it to run in its friction strap, the pull of which is borne by the clutch and so transmitted to the winding drum, so that the force is not lost.

4. Pitch chains for transmitting the power of the engine to the winding drum are made as follows:—"Every alternate link of the chain is formed by bending and welding up a flat bar into an oval link, and these links are connected together end to end by other links each formed of two plates and a pair of metal pins." The spaces between the plates serve to receive the teeth of a chain wheel.

5. An implement for ploughing is described. A metal frame is mounted on a pair of wheels in front and a castor wheel behind. Drums are fitted in front, to which both ends of an endless rope are secured. To the frame two smaller frames are connected "one on each side of the centre line of the first frame." These are mounted so that they can be raised and lowered, preferably by being pin-jointed to the front of the frame, and raised by a chain and drum behind. Each of these frames carries a set of ploughs, one set right-handed, the other left-handed. The implement is turned at the end of each bout, and one or other of the frames lowered as required. The front wheels are adjustable as to height, as each runs alternately in a furrow and on the land.

Instead of ploughs, the implement may have scarifying tines, &c. affixed thereto, and then only a single inner frame is required, as the tines on both sides of the implement can be employed simultaneously. A tine may be fitted so as to take out the traces of the hind castor wheel. The wheels do not require adjustment.

5 In the Provisional Specification a method of increasing the diameter of a chain wheel used for transmitting power from the engine to the drum is alluded to but not specially described. It is stated that "this is done by setting the surface " on which the chain rests at a greater distance from the " centre of the wheel, and also the distance of the teeth of " the wheel from the centre may be made capable of adjustment." No allusion to this appears in the Final Specification.

[Printed, 1s. 4d. Drawings.]

A.D. 1860, April 27.—No. 1062.

AGER, GEORGE.—"Apparatus for breaking up or opening " land."

A frame mounted on running wheels carries a number of tine wheels on a transverse shaft. In front of these are an equal number of rotary coulters. Between the tine wheels are fixed coulters; and there are suitable clearing plates to clear the tines from soil. The tine wheels, &c. can be raised and lowered by racks.

[Printed, 6d. Drawing.]

A.D. 1860, April 28.—No. 1070.

SAMSON, WILLIAM HENRY.—"Apparatus for the cultivation " of the soil."

A frame is mounted on a pair of large bearing wheels behind, and a pair of small guide wheels, or a single guide wheel in front. The part of the frame in front of the large wheels is rectangular and set diagonally to the line of progress of the machine. It carries a shaft also diagonal to the centre line. On this shaft are set tines, fitted with forks or prongs, which act partly sideways as they revolve on the diagonal shaft which is driven by mitre gearing from the running wheels. On stems projecting downwards from the diagonal frame are fixed shares with mould boards. The front corner of the

frame is supported on a small wheel. The shares and forks are moveable, so that any of them can be dispensed with as required. In order to ensure the draught being in the line of greatest resistance, the traction rope can be shifted to any one of several notches in the holdfast. The axle also of the steering wheels is moveable transversely in the frame. "Pairing " shares " "combined plough shares and mould boards, turn " furrows " or other implements as required may be carried on the standards below the discs. The shaft also and discs may be removed, or any of the forks as required. Levers are arranged at both ends to adjust the working height of the apparatus.

As a modification, the shaft may be set transversely across the machine instead of diagonally, but the latter is preferred. A small machine, available for hoeing between rows of plants, may be constructed in this manner. It has the distance apart of the wheels adjustable, and there is a guard partly embracing " the revolving discs," "which prevents the soil thrown back " by the discs from falling on or burying the young crops."

[Printed, &c. Drawings.]

A.D. 1860, April 30.—No. 1092.

LANSLEY, JOHN.—(*Provisional protection only.*)—"Im-  
" provements in harrows."

The following is the whole Provisional Specification :—

"This invention relates to a peculiar construction and ar-  
" rangement of harrow, whereby great lightness and economy  
" of construction are obtained. According to this invention  
" it is proposed to make the whole of the parts of the harrow  
" of wrought iron; the beams, in place of being of a zig-zag  
" form, are slightly curved in plan, similar to the beams of  
" ordinary wooden harrows, and each harrow of the set is  
" connected to the other by a tubular bar or rider, which is  
" coupled at each end by links to the centre portion of the  
" top of the harrow, thus keeping the several harrows to-  
" gether. The teeth of the harrow are each bolted to the  
" sides of the beams by long bolts passing through the several  
" beams, and through the heads of the teeth tubular stretchers  
" of wrought iron being passed on to the bolts, and interposed  
" between the beams so as to keep them the proper width  
" apart, the whole being tightened up by nuts outside the

" harrow. The draught is applied to the front corner of each  
 " harrow, a suitable notched draught iron being bolted to  
 " each harrow for connecting it to the whippetree."

(Printed, &c. No Drawings.)

A.D. 1860, May 3.—No. 1113.

TOOMER, GEORGE ELGAR.—(*Provisional protection only.*)  
 —Plough.

The invention refers to " Kentish turn-wrest " ploughs. The whole plough is of iron. The beam and handles are of wrought iron, the frame of cast iron. The sole plate is " tubular, the roof of the tube being cast in one piece with " the frame," the sides of wrought iron or steel with a " chilled " bottom plate." This is " dovetailed at the fore part into " the 'buck' which forms a socket for the share." " This " buck is provided with a lug at its upper part to receive a " screw bolt, which firmly secures it to the tubular sole plate ; " the share is fixed to the buck in the ordinary manner." " The breast is fitted to the frame by dowel pins." " The " rise or mould board slides into the tubular sole plate at the " fore part, and is retained in position by an oval steel spring " pin which snaps into place, and at the heel it is attached " to a notched standard by a compressed slotted bar, which " connects it with an adjustable lug on the notched bar." " By the mean the vertical and lateral adjustment of the " mould board is secured to suit the width and depth of the " furrow." The mould board may be attached on either side. The coulter can be regulated as to its angle by a screw and a chain, and laterally by screws. The head of the plough can be adjusted on the standard of the front wheels.

(Printed, &c. No Drawings.)

A.D. 1860, May 8.—No. 1139.

SUTTON, DANIEL.—(*Provisional protection only.*)—" Rol-  
 " lers for rolling and brushing land."

The following is the whole Provisional Specification :—

" This invention has for its object improvements in the  
 " construction of rollers for rolling and crushing land. For  
 " these purposes each roller is composed of one or more series  
 " of narrow rollers, but in place of all the rollers of a series  
 " being mounted on a common axis or shaft, each narrow

“ roller moves on its own axis, which is carried by an upright  
“ bar, which is attached to a lever, and the series of levers are  
“ mounted and move on an axis above the series of rollers, and  
“ according to the nature and state of the land the levers have  
“ a greater or less amount of pressure put on them by varying  
“ the positions and amount of weight on the levers; or in  
“ place of weights being used for this purpose, springs may  
“ be employed to act on the separate sections of a roller. By  
“ these arrangements each narrow section of a roller can rise  
“ and fall independently of the others. Each roller, whether  
“ composed of one or more series of narrow rollers, is mounted  
“ in a suitable framing and provision is made for applying  
“ wheels thereto, in order to facilitate their being moved from  
“ one place to another without the rollers coming to the  
“ surface of the road on which they are moved. The peri-  
“ pheries of the narrow rollers may be made plain or suitable  
“ for crushing and breaking up the surface of land.”

[Printed, 4d. No Drawings.]

A.D. 1860, May 9.—No. 1152.

HOWARD, JAMES, and LILLEY, JOHN.—Horse hoe.

The object of the invention is to adapt with certain modifications to lever horse hoes “the principle of steerage already  
“ adopted in horse hoes where a set of hoes is fixed to a  
“ common carrying bar.” “From a centre pin carried by  
“ the frame at the point of junction with the handles” is  
suspended “a sway bar, from the ends of which depend links  
“ that carry a jointed or compound bar; this bar is pierced  
“ with holes along its whole length to receive pins for securing  
“ a series of links thereto, and these links serve to support  
“ the hinder ends of the hoe levers, which are grouped to-  
“ gether in twos and threes.” These levers are secured to  
a slotted lever bar in front, which is supported on a pair of  
wheels, and is adjustable thereon to regulate the working  
height of the hoes. The hoes can be raised from the ground  
by the handles, but there is also a lever hinged to bracket  
arms in front which lifts the steering handles and hoes from  
the ground. The lever and steering handles may be held  
together by a catch, to keep the hoes off the ground when the  
implement is being moved from place to place.

[Printed, 10d. Drawing.]



A.D. 1860, May 15.—No. 1191.

SAMUELSON, BERNHARD. —(*Provisional protection only.*)—

"Reaping and mowing machines."

The following is the whole Provisional Specification :—

"The reaping and mowing machine patented by W. S. Clarke cuts the crops by means of reciprocating knives, and such crops when cut are removed from the cutting track towards one side by the sweep of a rake, which rake is actuated by gearing put in motion indirectly by the draught power applied to the machine. In machines of this description, as hitherto constructed, there is this defect, that as the cut crop must be discharged in a line at right angles to the travel of the knife, a very considerable sweep of the rake is required, and moreover that such sweep of the rake has a tendency to press the corn against the fence at the 'off side' of the machine. Now my improvement consists in so regulating the sweep of the rake or its equivalent in the said machine of W. S. Clarke (and any others in which a rake or its equivalent moves in a curve whilst sweeping off the crop), that the foremost line of the sweep of the rake shall correspond with the narrowest portion of the platform or its equivalent, and further in placing the cutting knife or knives of the machine in such a position that they shall not traverse in a line at right angles to the line of draught of the machine, but shall on the contrary traverse in a line forming an obtuse angle with such line of draught."

[Printed, 4d No Drawings.]

A.D. 1860, May 17.—No. 1216.

NICHOLSON, JOSEPH.—Reaping machines.

"The whole of the machinery is carried by one cast-iron bracket, from the outside of which projects the axle pin which carries the large driving wheel. The height of the cutting mechanism can be regulated or adjusted by inserting the axle pin into one or other of a series of holes made at different heights in the bracket, and shifting the small wheel at the opposite side of the platform of the machine to correspond." The centre of the driving wheel is nearly in a line with the cutters, and the holes follow the arc of a circle struck from the centre of the pinion driven by an internal spur

wheel on the main wheel. The draught pole is bolted to the top of the bracket and its angle can be altered by shifting the bolts.

[Printed, 8d. Drawing.]

A.D. 1860, May 17.—No. 1222.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Arthur Legros.*)—(*Provisional protection only.*)—"Mowing Machine."

The following is the whole Provisional Specification :—

"This mowing machine is composed of a fore and an after carriage. The after carriage is supported upon two wheels, and carries handles for pushing the machine forward by hand, or shafts when horse power is to be applied. The fore carriage is supported upon one wheel, and the frames of the carriages are so connected as to allow of the fore carriage following any irregularities in the ground. To the front of the fore carriage a species of coulter is fixed, the distance of which from the ground can be regulated according to the height of cut required. The coulter is prolonged backwards in the shape of two wings or rails carried back at an angle, one on each side of the machine. To the coulter on each side the front end of a cutting blade is fixed, while the rear end on each side of the machine is held in an adjustable support projecting laterally from the machine, whereby the breadth of cut, and elevation of the blades from the ground, can be regulated; the cutting blades lie below and nearly parallel with the rails above mentioned, and these latter turn over the crop after being cut out of the track followed by the machine."

[Printed, 4d. No Drawings.]

A.D. 1860, May 22.—No. 1255.

GREEN, JOHN.—"Ploughs, cultivators, and similar agricultural implements."

The mould board "is made nearly straight and is fixed, and stands almost in a vertical position; the object to be effected being the conveyance of the cut earth from out of the track of the plough without turning it over; which is usually at present done. Behind the share and inching from behind it upwards at an angle of about 20° or so, from the plane of

" the ground, are fixed two or more bars ; " " these are firmly  
 " attached to the body of the plough, are of convenient  
 " lengths, and have their upper surface angular. At the back  
 " of the share and lying upon a portion of the bars, is a plate  
 " for the purpose of conveying the soil from the share to the  
 " bars. As the plough proceeds the earth is forced upwards  
 " along these bars and comes in contact with a breaking appa-  
 " ratus composed of a rotating cylinder of any suitable ma-  
 " terial (preferably wood) having iron spikes of various forms  
 " attached to and projecting from its surface, or it may be  
 " composed of a series of wheels on a round axle, their peri-  
 " pheries being serrated or furnished with a number of spikes  
 " or similar projections. The cylinder or spiked axle is fixed  
 " to the plough by means of an iron framing attached to the  
 " beam at a point a short way in front of the coulter, and in  
 " such a way that it radiates and oscillates about that point,  
 " thus allowing it to rise and fall." It may be loose or rotated  
 " from the plough wheels. A similar apparatus may be applied  
 " to other implements. In "skims or cultivators" there is  
 " a breaking apparatus similar to that for the ploughs, but its  
 " length is varied according to the width of the implement.  
 " The bars are attached to, or placed at the back of the cutting  
 " wings or knives. The framing of the revolver is similar to  
 " that of the plough and radiates from nearly a similar point ;  
 " one extremity being on the frame of the implement, the  
 " other being only attached to each end of the spindle of the  
 " revolver." There is also " in front of the legs or standards,  
 " a coulter for the purpose of cutting the soil, similarly to the  
 " ordinary plough."

[Printed, 10d. Drawings.]

A.D. 1860, May 29.—No. 1328.

PATERSON, ALEXANDER JOHN. — "Agricultural traction  
 " engines and implements."

Sets of "lazy-tongs" are affixed to the front of a locomotive  
 engine, and at their other ends they carry anchors. The  
 "lazy-tongs" are alternately extended, the anchors take hold  
 of the ground, and the engine is drawn up to them. The  
 "lazy-tongs" are operated by screwed shafts with nuts travel-  
 ling thereon. Each shaft has a right hand screw on one half  
 of its length, and a left hand on the other half, and their nuts

travelling on these screws are brought together or drawn apart by the revolution of the screws. The ends of the tongs being connected to the nuts they are extended and retracted. The direction of motion of the screwed shafts is alternated as required by clutches. The anchors are mounted on carriages, and are presumably forced into the ground by the drag backward of the engine. Ploughs, &c. mounted in suitable carriages are attached behind the engine. Or "they may be fixed to the lazy-tongs in place of anchors."

Besides the above, the following improvements are mentioned in the Provisional Specification only:—(1.) To turn the machine one of the wheels is raised off the ground by a block of wood placed under the nave and elevated by screws. "On the guide wheel being properly placed, and the other wheel being caused to revolve, the whole machine revolves on a socket formed in the block." (2.) "An agricultural implement for turning the soil" is formed of "two pieces of metal or other material fixed at right angles" or of "a single piece formed with sides at right angles," "such implement being made to enter and pass through the soil, and afterwards to turn over and deposit its contents in a reversed position." "Several of these implements can be attached to one machine in order to cut several furrows at once."

[Printed, &c. Drawing.]

A. D. 1860, May 31.—No. 1348.

CLAY, CHARLES.—"Implements for scarifying and grubbing or cutting up weeds, and otherwise cultivating land."

A central beam like a plough beam, with a wheel in front, has jointed to it a little behind the wheel a pair of long arms which extend backward and form steering handles. These arms can move horizontally, but their play is limited by a notched cross-bar fixed at the back of the central beam. Spring catches on the arm take into the notches, and can be released by the attendant who has hold of the handles. The distance of the side arms and the central beam can thus be regulated. On each of the arms and on the beam a tine is fitted. A small chain harrow is attached to the implement behind the tines. The implement is principally intended to work between rows of plants. It may be constructed with

several beams, &c. connected by a cross bar, to act on several rows at once.

[Printed, 6d. Drawing.]

A.D. 1860, June 4.—No. 1367.

GEDGE, WILLIAM EDWARD.—(*A communication from Jean Eugene Pellier.*)—(*Provisional protection only.*)—"Apparatus for manuring land."

The following is the whole Provisional Specification:—

"This apparatus is specially intended for the equal distribution of pulverulent manures, such as guano and other, and is composed of a trough or hopper made of light boards, and furnished interiorly with metal rods, carrying plates of the same material, to which a come-and-go motion is given in the manner hereafter mentioned for the purpose of separating and equally distributing the manure contained in the trough. The whole is supported by a wooden framing mounted on wheels, and from which project the shafts, if horse-power be used. The horse being set in motion, the wheels, in revolving, turn certain cogs bolted to their axes, which cogs act upon pinions, one of which, by the aid of a connecting rod, gives a come-and-go movement to the metal plates or agitators, causing the dispersion of the manure, and the other, in rotating, gives, by the aid of a shaft and catches, a winnowing movement to a valve placed beneath the trough, the effect of which is to shake the manure and facilitate its equal distribution. A spring and lever is provided for throwing the apparatus out of gear when required, a moveable board prevents the air striking too forcibly upon the manure as it escapes from the trough, and a regulator prevents the exit of more than the requisite quantity of manure."

[Printed, 4d. No Drawings.]

A.D. 1860, June 6.—No. 1394.

CRANSTON, WILLIAM Mc INTYRE.—(*A communication from Walter Abbott and William Anson Wood.*)—"Ramping machines."

The improvements refer to the delivery apparatus. An endless band travels round four pulleys at the corners of the platform or of a square table forming part of the platform.

Over the platform a rake or sweep formed of a board fixed to a long stem works. The point of the rake is affixed to a point on the band, and the end of the stem is held in any suitable way at a fixed point in the rear of the platform. Two methods of doing this are described :—(1.) The stem is jointed, and its end pivotted to the fixed point; (2.) The stem slides through a block pivotted at the fixed point. The effect of this is that the rake travels over the platform or over such portion of it as the endless band may surround, being kept approximately vertical and with its face in the same direction. It is pushed forward along one side, carried across the front, taking the cut crop with it and delivering it at the other side, retracted along that side and carried across the back to its original position.

Besides the above the following passage occurs in the Provisional Specification alone no reference being made thereto in the Final :—"Two joints are employed to connect the cutter bar and the table to the main frame, one joint in front and the other behind the inner one of the pair of main or driving wheels, and the wheel which supports the outer end of the cutter bar and table is placed so that the axis on which it turns may be in the same vertical plane as the axle of the main or driving wheels, either exactly or with sufficient accuracy to prevent this wheel in any way interfering with the turning of the machine."

[Printed, 10d. Drawing.]

A.D. 1860, June 8.—No. 1416.

JOSLIN, GEORGE, JOSLIN, HENRY CRUICK, and JOSLIN, JOHN.—"Reaping machines."

The object of the invention is to enable reaping machines to be taken through gates, &c.

1. In order to make the machine narrower so that it may pass sideways through a gate, parts thereof are made to turn up or down. The divider is jointed across its length and the front part or "cone" is carried by a bar jointed to the frame by a universal joint. This part is held in place by a pin, so that when it is required to decrease the size of the machine, the pin can be taken out and the cone turned up and to one side. The arms of the reel also are made with folding joints.

2. Rollers are fitted to arms on the frame so that they can be turned down and the weight of the machine received thereon.



They are secured by pins and the machine then runs on them, so that it can be drawn on them sideways through the gate.

[Printed, 8d. Drawings.]

A. D. 1860, June 13.—No. 1448.

SPENCE, WILLIAM.—(*A communication from George E. Vanderburgh.*)—"Reducing silicious substances to a fluid state."

The liquid silicate is prepared by treating sand or other suitable siliceous substance mixed with a small per-centage of an alkaline base, as potash or soda, by superheated steam, in a digester. By incorporating sand, &c. with the silicate a composition may be formed that may be "compactly moulded into the form of a millstone or of a polishing wheel or of a whetstone, hone, razor strop, scythe, rifle, or other article to which the said paste or composition is or may be rendered applicable."

[Printed, 8d. Drawings.]

A. D. 1860, June 16.—No. 1468.

DRAY, WILLIAM, and GARDINER, ROBERT.—"Reaping and mowing machines."

1. Improvements on "Dray's improved Hussey's machine." This part of the invention consists in "causing the knife to project laterally at an angle other than a right angle to the line of draught, and from the after end instead of from the fore end" of the frame of the machine. A tension rod is stretched across from the end of the finger bar to a point on the frame or on the pole, at such a height as to clear the standing crop. The finger bar is jointed to the frame, preferably by a rule joint. The finger bar and knife may be "brought round parallel with the side of the machine," or "turned back behind the machine." The frame carrying the divider is jointed, to allow the latter to adapt itself to inequalities in the ground. A running wheel is mounted on a lever arm at the end of the finger bar and by its aid the height of the cutter can be adjusted. There is a running wheel on the pole. "The wheels usually placed outside the frame are dispensed with."

2. The platform is hinged to the frame in front and arranged so that it may be lowered at intervals to discharge the cut crop.

In the drawing a platform is figured which is supported at the rear by india-rubber springs, and is depressed by the attendant pressing it down with a rake. "Suitable levers or other equivalent contrivances" may also be used for this purpose.

3. The platform is formed of "several breadths or sections, which are so supported upon centres that they may be at will turned partially about them for the purpose of jerking or otherwise moving the cut crop clear of the knife." These breadths or sections may be made to turn wholly round by means of a rack and wheels," or otherwise. For mowing machines a platform consisting of "a single piece supported on centres" is sufficient.

4. This head "consists in the employment of transverse bars or tubes for the reception of the cut crop as it falls from the knife, such bars in some cases being placed a few inches above the platform, and in others taking the place of a platform. The object of these bars or tubes is to facilitate the raking off of the cut crop at the side."

5. The platform is fitted with endless travelling bands, driven by a spiked wheel in contact with the ground. On raising the end of the platform, this wheel is raised off the ground, and the motion of the bands stopped. Thus the crop may be laid in bundles for sheaves. Or the spiked wheel may be on the side frame, and a spur wheel on its spindle may be thrown in and out of gear as required with a spur wheel on the spindle of the band roller.

[Printed, 1<sup>st</sup>. Drawing.]

A.D. 1860, June 18.—No. 1477.

KING, JOHN, and SOUTHAM, FREDERICK. —(*Provisional protection only.*)—"Rope porter to be used in steam ploughing or cultivating."

"The upright which carries the pulley is not fixed rigidly to the bar which supports it, but turns upon a joint on the said bar. The said upright can be fixed or held in a vertical position by a lever jointed to the bar carrying the upright, the said lever carrying at its short end a stop or catch, which engages with the upright and fixes it vertically. The said lever is pressed upon by a spring to make it act upon the upright. When it is wished to throw

" the rope off the pulley, the lever is pressed and disengaged  
 " from the upright carrying the pulley, and the bar of the  
 " porter is slightly raised. The upright carrying the pulley  
 " immediately falls slightly beyond the two wheels of the  
 " axle or shaft, by which means the rope is released from the  
 " pulley, and falling against the front of the wheels the rope  
 " porter is forced back or assisted back out of the path  
 " traversed by the plough or cultivator."

[Printed, 4d. No Drawings.]

A.D. 1860, June 19.—No. 1481.

BRABY, JAMES, the younger. — "Machinery for lifting or  
 " breaking up roads or ways, crushing clods, and scarifying  
 " or tilling land."

The implement consists principally of two conical or  
 cylindrical rollers set in a suitable frame, the peripheries  
 of which are furnished with projecting tines, " which as  
 " the cones or rollers rotate over the road or land will  
 " penetrate or enter, and will break up the surface." The  
 form of the tines may be varied. "The axles of the  
 " conical rollers are set at an angle to each other, as well as  
 " to the surface of the ground, so that the projecting teeth  
 " or tines when they penetrate the surface will tear it up.  
 " For the convenience of transporting the machine from one  
 " place to another and also to admit of regulating the depth  
 " to which the projecting teeth or tines shall penetrate the  
 " surface, the machine may be mounted on a pair of running  
 " wheels provided with adjustable bearings and elevating  
 " screws, or other equivalent contrivances whereby the rollers  
 " or cones may be raised up or let down." The frame in  
 which the rollers are set has a cross bar between the rollers,  
 and to this the drawing shafts are pivotted by a vertical pin so  
 that they can be turned round and secured either to the back  
 or front of the frame so that the roller can be drawn in either  
 direction without turning.

[Printed, 10d. Drawing.]

A.D. 1860, June 22.—No. 1526.

BROOMAN, RICHARD ARCHIBALD. — (*A communication from  
 Gustave Humeir.*) — Horse rakes.

The invention consists in a method of raising the tines at intervals. A long lever is pivotted to the front of the frame. Its hinder part extends back over the tines, and is connected by a chain to a second lever which bears against the under side of a bar passing below the tines. Thus the lifting of the end of the first lever raises the tines. The lower end of this same lever has a piece jointed thereto. As the implement moves forward this jointed end rests on the ground, and holds the lower end of the lever, the upper end is drawn forward and the tines are raised. By this time the lever has passed the perpendicular, the joint yields, and the tines fall by their own weight. In the Provisional Specification it is stated that the jointed end of the lever is to be placed in position by an attendant. From the Final, it appears that this is effected automatically, as no means of effecting the movement are referred to. A counterbalance weight is also shown in the drawing attached to the Provisional Specification. This is to "ease the fall of the teeth on the ground." No such device is referred to in the Final Specification.

[Printed, 8d. Drawing.]

A. D. 1860, June 25.—No. 1541.

CREASER, HENRY.—"Reaping and mowing machines."

The improvements are applicable either to machines drawn by horses at the side or propelled by horses pushing from behind.

1. The divider is formed of "a half cone of wood," &c., "fixed over one or both of the wheels in a slanting direction, the point of the cone being forward and downward."
2. "The gathering reel is mounted on a spindle of iron tubing, and is carried or supported at one end only."
3. There are two sets of fingers, sharpened at their edges, and the cutter works between them. It is formed of "one continuous steel plate, and sharpened in a W form." "The fingers are to be fixed to a movable bar with spring so as to rise up and down to suit the ground, and the driving rod is to work under the first platform."
4. One or both of the running wheels are "dished upon the inner face in order to allow the end of the cutter to oscillate within the rim of the wheel when the machine is at work,

" the rope off the pulley, the lever is pressed and disengaged  
 " from the upright carrying the pulley, and the bar of the  
 " porter is slightly raised. The upright carrying the pulley  
 " immediately falls slightly beyond the two wheels of the  
 " axle or shaft, by which means the rope is released from the  
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 " screws, or other equivalent contrivances whereby the rollers  
 " or cones may be raised up or let down." The frame in  
 which the rollers are set has a cross bar between the rollers,  
 and to this the drawing shafts are pivotted by a vertical pin so  
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"fixed over one or both of the wheels in a slanting direction  
"the point of the cone being forward and downward
2. "The gathering reel is mounted on a spindle of iron  
"tubing, and is carried or supported at one end &c.
3. There are two sets of fingers, sharpened at their ends  
and the cutter works between them. It is a  
"continuous steel plate, and sharpened in a wavy line  
"fingers are to be fixed to a moveable bar which  
"to rise up and down to suit the ground &c.  
"is to be fixed to the first platform  
4. "of the running wheels  
"to allow the end of the machine to rise  
when the ground is uneven &c.



" and to be fixed in a line with the fingers, in order that the  
 " working up and down of the shafts shall not interfere with  
 " the distance of the fingers and cutter from the ground."

5. Behind the cutter fluted or pegged rollers are fitted transversely across the machine. Behind these again are endless bands, running across the machine, so as to deliver the cut crop to the side of the machine. These bands run at different rates, so that "the last strap shall travel quicker and  
 " longer than the first one, so as to carry round the ears of  
 " corn, form it into a proper swathe, and leave it on the  
 " ground at one or both sides."

6. "The machine is also provided with racks and spring bars  
 " so arranged as to throw the implement out of gear when  
 " it is moved backwards, and into gear when it is moved  
 " forwards."

[Printed 10d. Drawing.]

A.D. 1860, July 2.—No. 1597.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from J. C. C. Meyn.*) Harrows.

The harrows are composed of a number of triangular plates linked together, and set each with three tines. The plates are set with the small end foremost. The first row is connected to a cross bar and the succeeding rows each to the one before it. Each plate is also linked to those on each side. The connecting hooks are by preference *ac*-shaped for ease of detachment. Each row is slightly lighter than the row in front of it. The plates may be hollowed out in the middle, and the weight may be regulated by the size of the perforation or otherwise. The plates are preferably formed of boiler plate iron.

For transport a wheeled frame is fitted to the harrow. A pair of wheels mounted on an axle tree are connected by side bars to the front beam of the harrow, and the hindermost row of plates is hooked to this axle-tree. A transverse bar supports the middle of the harrow, and a pair of guide wheels are mounted on the front beam.

[Printed, 6d. Drawing.]

A. D. 1860, July 6.—No. 1636.

MITCHELL, BENJAMIN.—“Machine applicable for harrowing, weeding, hoeing, and other agricultural purposes.”

“The said machine is applicable for the purposes of harrowing, weeding, hoeing, cultivating, sowing, and drilling. From beneath a suitable carriage frame a harrow is freely suspended by chains or otherwise, the tines or teeth of the same being moveable, so as to enable the same being removed from the harrow frame for the purpose of substituting tines of a shape suitable for cultivating, hoeing, or thinning, according to the operation required to be performed, and in order to give a zig-zag motion to the said harrow frame as it is drawn over the land. The end of the said frame is connected with an universal jointed connecting rod attached to a crank under the carriage frame for the purpose of imparting a transverse motion to the harrow. The said crank is worked by bevil gearing driven by toothed wheels placed on the hubs of the carriage wheels. When the harrow is required to work in a straight line the driving shaft can be thrown out of gear by means of a lever provided for that purpose. The chains supporting the hinder part of the harrow frame are attached to a windlass to permit the said frame being drawn up behind and released to fall with a jerk, for the purpose of freeing the harrow from weeds and rubbish. Seed troughs are fitted in front of the carriage to enable the machine being used for sowing, so that the machine may be used for sowing and harrowing at one and the same time.” Rotary brushes are arranged to work within these boxes. “To enable the machine being used for drilling, extra shaft bearings are fixed on the carriage, so that by the addition of an ordinary drill box and apparatus it can be used for that purpose.” The distance apart of the wheels can be regulated by means of a screw.

[Printed, 10d. Drawing.]

A. D. 1860, July 12.—No. 1684.

OSBOURN, FREDERICK.—(*Provisional protection only.*)—“Endless saws and cutters.”

These are applicable to various purposes and are modified accordingly. The saw is composed of “pieces of thin sheet

" steel jointed together to form an endless chain of cutting  
 " edges, which when brought into operation is extended over  
 " grooved pulleys." For "harvesting machines," the cutters  
 have a "sickle or other shape "that will best adapt them for  
 " severing the standing crops."

[Printed, &c. No Drawings.]

A.D. 1860, July 17.—No. 1730.

BAMLETT, ADAM CARLISLE.—"Reaping & mowing machines."

The following is the description given :—

" My invention relates, first, to a coil or other spring applied  
 " to the stem of the swivel wheel usually placed under the  
 " front of the framework on the outside of the 'Hussey  
 " reaper,' to enable the machine to work more steadily over  
 " uneven ground ; this machine may further have a lever or  
 " ratchet for elevating or depressing the knife.

" Secondly, in applying a small wheel mounted on a stem  
 " or otherwise from the inside of the framework of the  
 " 'Hussey reaper,' near to the first finger, which is of advantage in backing the machine when it is used for mowing,  
 " and also to regulate the height of the knife ; it also reduces  
 " the friction of the shoe, which may in part be dispensed  
 " with.

" Thirdly, in causing the driving wheel to bite the ground  
 " when mowing ; I fix teeth to radiate from the periphery by  
 " screws or otherwise so as to enable their removal when  
 " required for reaping.

" Fourthly, in the application to the fingers of reaping and  
 " mowing machines of a lining or steel facing rivetted or  
 " otherwise similarly fixed thereto, forming an overhanging  
 " sharp edge for the knife to cut against, which renders the  
 " machine less liable to choke and reduces the draught required. I also make the upper part of the finger broader  
 " than the cutting edge, which keeps the crop better up to  
 " the knife.

" Fifthly, I make the platform of reaping and mowing machines jointed over, or in the rear of the finger bar to assist  
 " the raker in delivering the crop ; I sometimes use springs  
 " to keep the platform in position till a sheaf is collected,

“ when the platform is depressed by the raker pressing his  
“ foot on it to effect the delivery, or I sometimes place one or  
“ more swivel wheels under the rear edge of the platform over  
“ which a seat for the raker is fixed who rakes the corn off in  
“ sheaves at the side of the machine.

“ Sixthly, to forming the cam actuating the cutting knives  
“ of a thin undulating surface, which is embraced by two  
“ truck rollers mounted on the lever which is actuated thereby  
“ and transmits the motion to the knives, and further I so  
“ form the cam surface or surfaces that the knives shall move  
“ quicker at the times of cutting than at other times of their  
“ motion.

“ Seventhly, to a revolving rake applied to swathe delivery  
“ machines having four sets of tines, (more or less), which  
“ rakes the corn into sheaves; when one set of tines has  
“ collected a sheaf, the attendant releases the axis of the  
“ revolving rake, which delivers the sheaf and allows another  
“ set of tines to come round to collect the next sheaf. This  
“ rake is mounted in jointed bars, which the attendant can  
“ raise, if required, which may be also supported by a spring  
“ or other suitable support in addition to the axis connecting  
“ the supporting bars of the machine.

“ Eighthly, in machines fitted with a pivotted travelling  
“ wheel; I lock the wheel in its normal position to prevent  
“ the machine scraping into the ground when it is backed,  
“ which locking the driver may readily effect by means of rods  
“ and levers, chains, or other apparatus carried within reach  
“ from his seat.

“ Ninthly, to cranking the finger bar so that the part near  
“ the fingers and the fingers shall be much nearer the ground  
“ than the part thereof which is fitted to the frame, in order  
“ that the machine shall be better adapted for acting on ridge  
“ and furrow land when used for mowing.”

[Printed, 104. Drawing.]

A. D. 1860, July 21.—No. 1771.

ROBERTS, SAMUEL.—“HARROWS.”

The invention relates to the manufacture of rotating harrows, the object being to make them rotate on even or uneven ground.

The following is the whole description given in the Final Specification, and that in the Provisional is in nearly identical words :—

"I form the harrow frames (which are two in number) of a circular or other suitable shape, into which are placed tines slightly curved towards their lower extremities, the outer curved part being "knife edged," for the purpose hereinafter mentioned. A vertical shaft is placed in the centre of each harrow, upon which are placed draft bars, the ends of these bars being attached to a horse-tree by universal joints, the horse-tree being about the same length as the distance between the centres of the two harrows. Thus when the harrows are drawn forward, the curved ends of the tines cause them to rotate, while at the same time the 'knife edges' of the tines cut through the clods of earth; the harrows having no connecting or cross bar (unless required to keep them apart) and therefore no connection with each other, each performs its own work, for instance, one may be perfectly horizontal, while the other is revolving on the side of a hillock or other unevenness of the ground, or they may both be horizontal or both inclining in the same or opposite directions, being capable of so doing by the action of the universal joints before mentioned, the horse-tree partially preventing the harrows coming into too close proximity one with the other."

[Printed, 4d. No Drawings.]

A.D. 1860, July 24.—No. 1783.

CLARE, WILLIAM.—(*A communication from Pierre Charles Kato*.)—"Apparatus for setting and sharpening scythes."

The apparatus consists of a small anvil fitted on the top of a stake which is driven into the ground. A sort of jaw is hinged to the anvil, so that it can be brought down on the top thereof and fixed by a screw, to hold the scythe blade down on the anvil. Through the top of this jaw works a "swedge" which rests on the scythe blade, and transmits the blows of the hammer thereto. It is raised after each blow by a spring. Adjusting screws serve to regulate the position of the blade.

[Printed, 10d. Drawings.]

A.D. 1860, July 28.—No. 1836.

LANSDELL, LAWSON.—(*Provisional protection only.*)—Harrows.

The frame is of cast iron, the portions thereof being cast with the "mortises, grooves or recesses" for the teeth. The tines are fixed "by forming mortises or passages passing vertically through the frame, and of such a size that the stems of the teeth may be able to pass freely through them." "The upper part or stems of the teeth where they enter the frame are not drawn down," "but are of the full size of the bar from which the tooth is made." "The teeth are clamped in the mortises" "by wedges or keys driven vertically" into them "or horizontally in cross passages or mortises either in front of or behind the stems." The teeth may also be held by binding screws or otherwise.

[Printed, &amp;c. No Drawings.]

A.D. 1860, July 30.—No. 1849.

NICHOLSON, JOSEPH "Reaping and mowing machines"

The invention "consists in jointing a bent bar to the cast-iron bracket carrying the driving gear as nearly as possible to the centre of the spindle carrying the crank pin for driving the cutter bar. Another bar is fixed to and projects from the cast-iron bracket, the end of which bar forms a guide for the bent bar and also carries a small running wheel. The bent bar is jointed to the shoe piece, to which shoe piece the finger bar is fixed at a point nearly in a direct line with the centre of the main driving wheel. The finger bar is then allowed free vertical motion independently of the running wheels, and is consequently able to follow all the inequalities of the surfaces of the ground. Between the finger bar and the bent bar a lever is applied, by means of which the finger bar can be raised clear of the ground." The cutting apparatus is driven from an internal spur wheel on the main running wheel. The pinion driven by this wheel is connected to its shaft by a ratchet, so that the machine can be backed without working the cutters. The pall can be removed from the ratchet by a stud on it engaging in a slot in a rotating plate which can be turned to hold up the pall. The driving apparatus of the cutters is thus thrown out of gear with the



running wheel. The stud of the main axle is "made eccentric, " so as to be capable of adjustment by being turned." This enables the pinion to be changed.

[Printed, 10d. Drawings.]

A.D. 1860, July 31.—No. 1853.

DOUGLAS, JOHN MONTEATH. — (*Provisional protection only.*)—"Delivery of the cut crops from reaping and mowing " machines."

1. The crop is received on an endless travelling web to which an intermittent motion is given by suitable gearing enabling the attendant to throw the actuating mechanism of the web into and out of gear with the driving apparatus as required.

2. The action of the gathering reel is stopped while the crop is being delivered. This is effected by the mechanism of the reel being thrown of gear by the same action as sets the web in movement, and *vice versa*.

[Printed, 4d. No Drawings.]

A.D. 1860, August 8.—No. 1920.

HALL, GEORGE, junior. — (*Provisional protection only.*)—Reaping machines.

The frame of the machine consists of two sloping side frames, tied together by a transverse bar carrying the fingers. Motion is given from a main bearing wheel to a crank working a slide connected to the cutter bar. The knives traverse two fingers at each stroke. A lever is arranged to throw the cutter out of gear. The gathering reel has six radial arms and "two of the arms " are placed at a greater distance asunder than the others, " so that an interval takes place in the gathering action of the " reel during each revolution " and thus the corn is delivered in bundles for sheaves. The height of the reel is adjustable, as is also its shaft. "The platform is hung so as to oscillate " upon a diagonal-formed shaft, and is retained by means of a " lever having a stud and friction pulley on its extremity, and " worked by a cam or tappet on the axle of the driving wheel." In front of the machine is a guiding wheel fitted so that the height of the back of the machine can be adjusted thereby.

[Printed, 4d. No Drawings.]

A. D. 1860, August 9.—No. 1393.

EDDINGTON, ALFRED.—(*Provisional protection only.*)—

“Draining ploughs.”

The following is the whole Provisional Specification:—

“This invention has for its object improvements in draining ploughs. For these purposes the coulter in place of being raised and lowered by the means heretofore employed is arranged to be raised and lowered by means of a screw and screw nut. The coulter when rising and falling is guided by means of a roller in front, and also a roller behind, a screw nut is by preference fixed or attached to the coulter and the screw which raises and lowers, the coulter turns in suitable bearings carried by the beam or framing of the plough.”

Printed, *id.* No Drawings.]

A. D. 1860, August 10.—No. 1940.

ENKLAAR, FREDERIK ADRIAAN.—(*Provisional protection only.*)—“Implements for cultivating the soil.”

The following is the whole Provisional Specification:—

“This invention consists in swivelling the coulters or arms carrying the tines or shares in boxes bolted or affixed to the frame of the implement, and in connecting the upper ends of the coulters or arms to two hand levers, the coulters in one row to one lever, and those in the other row or rows to the other lever. The boxes are so shaped on the inside, that they admit of the coulters being raised out of the ground by means of the hand levers when choked by weeds or when otherwise desirable to lift them. The coulters in one row can be raised and freed without stopping the implement and without interfering with those in the other row or rows.”

Printed, *id.* No Drawings.]

A. D. 1860, August 11.—No. 1947.

PHILLIPS, RICHARD.—(*A communication from Jesse Whitehead.*)—(*Provisional protection only.*)—“Harvesting machines.”

“In this machine it is preferred that the power should move before it nearest to the side on which is placed the driving wheel.” “The other side of the machine is carried by the

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" grain wheel of peculiar construction, and shielded with the " shoe." This wheel is concave, the hollow side being towards the machine, to allow the cutter bar to "play laterally without " coming in contact with the wheel." The bearing wheel is of large diameter and set in an inclined position to prevent its injuring the grain, as this "brings the tread of such wheel " inside the line which the separating point or shoe makes in " the grain, and nearly under the cutting knives." "The shoe " is made with a recess in it to receive the rim of such wheel, " the outward and forward edge of the separator being " brought out so that it will gather the grain into the cutters." "The large diameter of the wheel also enables the machine to " be passed over a water furrow or rut." There are two rakes, termed "automatic rakers," one larger than the other. The large rake is mounted on a "travelling carriage" and is actuated by cords from a pulley driven from the main axle. The travelling carriage is actuated by a cam on the main axle. The smaller rake "passes downwards over the recessed end of the plat- " form" after the large rake.

[Printed &c. No Drawings.]

A.D. 1860, August 18.—No. 2008.

ROMAINE, ROBERT.—"Machinery applicable to steam culti- " vation."

The first part of the invention relates to winding apparatus for steam ploughing. The second part refers to double-action ploughs, of which three descriptions are enumerated.

1. Two parallel beams are pivotted on the axle of a pair of bearing wheels; a counterbalance weight is attached to each beam in front, and two plough bodies behind, one above and one below the beam, looking in the same directions. At the end of the bent the ploughs are tilted over. The rear ends of the beams are supported by small wheels on stalks. The depth of the ploughs is adjusted by screws, and they can be raised by a hand lever.

2. The beams are connected by end pieces with trunnions fitted in slots at the ends of the frame. The slots are wider above, so that when the trunnions are raised by a chain on a winding pulley the beams can be swivelled round. Plough bodies are fixed in pairs to the beams above and below, the

upper and lower sets looking in opposite directions. The ploughs can be raised by racks and pinions. The frame is mounted on a pair of bearing wheels in the middle and on castor wheels at the ends. The main bearing wheels can be turned from side to side for steering in the method described in the third part.

3. "A double action plough adapted to a traction engine" is formed with two sets of beams carrying ploughs and pivotted on a transverse shaft under a platform carrying an engine. A chain passes over fixed pulleys and is connected to each set of beams. By this chain one set can be raised and the other lowered proportionately.

The third part of the invention relates to a method of steering traction engines, applicable also to agricultural implements. The wheels are mounted on arms pivotted on vertical pivots. On the inner ends of these arms are segment racks, the racks connected with each pair of wheels gearing into a pinion between them. On giving rotary motion to this pinion the racks are driven in opposite directions and the wheels shifted as required. The pinions belonging to any number of pairs of wheels may all be operated together by a single shaft with worms thereon. To allow for inequalities in the ground, the shaft has universal joints and sliding socket joints thereon. In traction engines the wheels may be turned as required by suitable gearing.

[Printed, &c Drawings.]

A.D. 1860, August 31.—No. 2106.

GERRANS, WILLIAM. — (*Provisional protection only.*)—  
"Horse rakes."

The following is the whole Provisional Specification :—

"I form the arms upon which the teeth of the rake are  
"secured in two parts, and joint them to the framework by an  
"universal joint, so that they may either be used together or  
"separately, or when not in use both parts may be turned  
"over and rendered portable for travelling. I employ a lever  
"handle for raising the teeth from the ground, the end of  
"which handle projects upon the back of the machine. I also  
"employ a pedal for the same purpose, to be worked by the  
"driver of the machine, so that when on his seat, by the  
"action of the foot on the pedal, it actuates certain toothed

" wheels in connection with the bar on which the teeth are secured; on this bar are also placed one, two, or more eccentrics or pieces of curved metal, corresponding with which, and in the front of the machine, are others over which pass chains, so that as the front bar is moved by means of the toothed wheels, put in or out of gear by the pedal, so are the teeth raised or lowered as required."

" For the purpose of adjusting the machine to the height of the horse, I use a horizontal screw and vertical pillar on a bent arm, and by means of a horn nut on the screw I wind or unwind the parts, so as either to elevate or depress them, by which means also the points of the teeth are set to work at any given distance above the ground."

[Printed, 4d. No Drawings.]

A. D. 1860, September 3.—No. 2122.

BOYD, JAMES EDWARD.—(*Provisional protection only.*)—

" Machines used for cutting, scattering, and collecting vegetables and other substances."

Among other improvements described, chaff-cutters are fitted, instead of feed rollers, with "a series of wrinkled or corrugated prongs, forks, teeth, or rakes, or other shaped contrivances." "The corrugation will either consist of one or more wrinkles or furrows down the length of each of the prongs," &c. "or by twisting or folding such teeth," &c. "down their centres." These prongs, &c. may be formed in one or a series of pieces "and a series "can be constructed to be bolted or otherwise fastened together, so as to form one continuous fork," &c. "Such teeth, rakes, or rollers" may be constructed "so as to admit of their being united, joined, or arranged, and by placing two or more of them on a revolving shaft and rollers or wheels, so to form a rotary feed roller or hay-maker, either for scattering or for gathering the hay in rows or cocks, and to be otherwise capable of re-formation at pleasure, either as feed rollers, drag rakes or revolving, collecting, or scattering haymakers." "The corrugation referred to is also applicable to the tines of digging forks."

[Printed, 4d. No Drawings.]

A.D. 1860, September 7.—No. 2159.

LACY, AUGUSTUS DACRE, and HOMERSHAM. WILLIAM COLLETT. — "Machinery [and implements for ploughing and "cultivating land,"

1. This consists in the combination of a "delivery apparatus" with a capstan. The delivery apparatus is of the sort described in No. 1989, A.D. 1857, "except that it is intended to be "applied either to the upper or the lower coil of the rope, "according to the direction in which the capstan is caused to "revolve." "The apparatus may be placed on the spudle "either in duplicate or singly." "The delivering pulley is "also by preference made with curved spring arms, of such "form as to render the pulley capable of exerting greater "pressure when delivering the tail rope than when guiding "the hauling rope." Guides may also be used "consisting "either of pieces of metal fixed so as to act on one or more "coils of the rope, and thereby move it upwards or down- "wards out of the line in which it enters on the capstan, or "of revolving discs, with their periphery acting against the "rope for the same purpose."

2. Stays are used to prevent the screw piles being drawn out of the ground. Such stays may be affixed to any part of the apparatus, the capstan, the rails for travelling pulleys, &c.

3. The screw pile is tapered at its end, and preferably of wrought iron.

4. Several piles are arranged in any suitable manner so that the strain may be distributed among them.

5. The frame of the rope porters is of wrought iron and timber, and "so constructed as to admit of being fixed together "by four bolts." The bottom frame is composed of four beams forming a square, and connecting by four bolts, by which also the two standards for the pulley are secured.

6. A "revolving coulter on ploughs or other implements" is caused to revolve in the opposite direction to that of the machine's progress "by means of gearing from the wheel of "implement, or other mechanism adapted for the purpose."

[Printed, 1s 4d. Drawings.]

A.D. 1860, September 27.—No. 2347.

JOHNSON, JOHN HENRY.—(A communication from H. Pettit Gaudet and Co.)—"Forging and rolling metals."



The rollers employed have a "progressive alternating motion." The motion is given them by "a vibrating lever" "keyed on to a rocking shaft which also carries a large spur wheel for transmitting its motion to the gearing of the rolls." "The vibrating lever is actuated by a rotating crank and connecting rod, and the gradual progressive motion of the rolls is obtained by increasing gradually the throw or stroke of the vibrating lever." This may be accomplished by a nut on a screw spindle extending along the lever, and joined to the end of the connecting rod. The screw being rotated by suitable gearing, the movement of the nut alters the effective length of the lever. Among the articles capable of manufacture by this method scythes are mentioned. These are rolled in pairs or four at a time, and afterwards separated by shears. The scythe blades may be rolled lengthwise or transversely.

[Printed 1s. Drawing.]

A.D. 1860, September 29.—No. 2360.

ROBERTS, JOHN.—(*Provisional protection only.*)—"Mode of and apparatus for harvesting corn and other crops."

Except the expression in the title, there is nothing in the Specification concerning the present series. It refers to a method of ventilating stacks, &c. by perforated tubes.

[Printed, 4d. No Drawings.]

A.D. 1860, October 2.—No. 2373.

HELLARD, ROBERT.—"Reaping and mowing machines."

The different parts of the invention are enumerated under the following eighteen heads:—

- 1 Using a "two or more wing revolving rake" over the cutters.
2. A "dividing or joint platform" of which the front part is fixed and the back moveable.
3. "Using a hanging travelling canvass or other revolving platform in a frame."
4. "The bearings of the reel vanes to work in iron or other slots, so as to be able to shift them forward or backward, also barrels or round wood rods for reel vanes."
5. Part of the driving wheel is cased with sheet iron to prevent clogging. A scraper is also fitted thereto.

6. The arms of the reel may be lengthened or shortened by sliding bars. Grooved plates are fitted to the cross-bar "for the purpose of portably securing the arms," which can be folded back. There is a "loose collar under the pulley, stayed with a moveable pin for throwing in and out of gear."

7. Chains are used instead of leather belts, for communicating motion to different parts of the machine.

8. "Employing universal joints to work the rollers on which the travelling canvass platform endless band or bands revolve," and "using sliding bearings or slots to contract or extend the distance of the rollers."

9. A roller is mounted "between the knives and the platform." This was not included in a former Patent, No. 626, A.D. 1859.

10. A "shield swather," of iron, board, &c. is suitably arranged "for the purpose of bringing round from the platform the top parts of the corn and grass" so as to lay the cut crop "at right angles or nearly so with the line of the machine's motion." The inventor prefers "using merely a triangular piece of board being in a sloping direction to the side of the machine, and for shearing a rake is used near the same for dividing the swathe into sheaves."

11. "A path shield clearer on the side next to the standing crop, having no direct bearing on the land, the object being to prevent the grass or crop falling on that part of the ground over which the machine has to travel in its cutting the next round, and a tract clearer on the other side." There is also a "lever-bar alongside the finger bar across the machine for raising and lowering the knives."

12. "Application of a double revolving cradle for receiving the cut crop" from the platform and "depositing it in sheaves on the ground." Also a "double outer frame for protecting the gearing parts on which the inner or axle of the main driving wheel or wheels rest, the draft being in a direct line from the inner frame."

13. "The joint wheel by the standing corn or crop so fixed to machines as to be always self-acting, not requiring manual or corporal aid for turning the corners."

14. "The lever that raises and lowers the knives next to the standing crop, to act without interfering with the self-action of the joint wheel when turning the corners."

15. An "edged tooth segment wheel" and pinion are used to actuate the moving platform. A lever for throwing the cutter into and out of gear. A lever for raising and lowering the cutter.

16. "Flanged pulley wheels with dugs, ribs, or cogs" are used to receive the endless chains.

17. A "shifting pulley guide" is used to tighten the chain working the reel.

18. A "double divider," the lower portion fixed and the upper moveable.

[Patented, &c. No Drawings.]

A.D. 1860, October 2.—No. 2381.

GARDNER, PETER and LINDSAY, ANDREW —(*Provisional protection only.*)—"Knives for reaping machines."

The following is the whole Provisional Specification :—

"This invention relates to an improved mode of making the  
"knives used in reaping machines, which serve to sever the  
"stalks of the grain or other crop to be cut. In the ordinary  
"way of making and arranging these knives, they are formed  
"of a triangular figure, the upper edges of the knife extend-  
"ing inwards from the apex are bevelled or chamfered off.  
"These chisel-like edges are serrated by forming teeth or  
"parallel indentations on the under side of the knife; at the  
"extreme edges these indentations cut through the metal, and  
"thus form small notches therein

"In the improved form of knives, the two sides which are  
"bevelled off have the teeth formed on the upper surface  
"instead of the under side. This mode of making them is  
"much superior, because in the ordinary mode, the teeth are  
"rapidly worn away by the reciprocatory movement of the  
"knives over the stationary finger bar. On the other hand,  
"the teeth of the knife made according to these improvements,  
"being on the upper side, are preserved to the last, at the  
"same time the action of the knife is easier, on account of its  
"smooth under surface moving unimpeded over the finger  
"or projecting points, which divide the crop, and facilitate the  
"cutting action of the knives."

[Patented, &c. No Drawings.]

A.D. 1860, October 3.—No. 2391.

**JAMES, ROBERT.**—(*Provisional protection only.*)—"Reaping and mowing machines."

The fingers have knife blades fitted to them and against these the cutters act. The cut crop is received on an endless web which carries it back and delivers it to two other webs which deliver it at the side. "One of these endless bands is longer and moves faster than the other, so as to present the ears of corn in the proper position." The webs are of canvas on india-rubber bands, the canvas being plaited to allow for stretching. Bars are fitted across to keep them in tension. The canvas is preferably waterproofed. For mowing the bands, &c, are removed.

[Printed, &c. No Drawings.]

A.D. 1860, October 4.—No. 2404.

**SOOTHERAN, JOHN, and CARR, JOHN.**—Reaping machines.

Part of the platform next the main framing of the machine is cut away so as to leave an open space through which the cut crop may fall on the ground as it is raked off the platform by hand. The portion of the platform to be traversed by the rake is thus lessened. At the outer end of the platform is a sloping board, resting against the dividing board, so that the corn, &c. at that end as it is cut slides down towards the centre of the platform. "Shifting pieces" may be added to the rear of the platform to increase its size when required.

[Printed, &c. Drawing.]

A.D. 1860, October 8.—No. 2426.

**SAMUELSON, BERNHARD.**—"Harvesting machines."

The invention consists in mounting such machines which have a platform on a pair of bearing wheels instead of one main wheel only. These wheels are set one on each side of the main framing. Either or both may serve to drive the apparatus. The object of this is to take the weight off any supplementary wheels at other parts of the machine. Three methods of carrying out the invention are described.

1. The finger beam or platform is bolted to the hind part of the frame, or to a bracket thereon, so that the line of the beam

" shall always be in the same direction relatively to a line  
" connecting the bearing points of the two bearing wheels."

2. The finger beam, &c. is attached to a stay rod pivotted to the back of the frame so that this rod is kept parallel to the connecting rod driving the cutters. By means of a "moveable  
" strut" the platform "can be prevented from declining  
" downwards at the off end." Thus the weight of the platform may be thrown either wholly or partly on the two bearing wheels.

3. The platform, &c. is prolonged "towards the near side of  
" the back of the gearing frame," and hinged thereto. It is fixed "in a line relative to a line made by the two bearing  
" points of the two bearing wheels" at or near the off side of  
" the bearing frame.

By the use of the second and third methods, the platform can be folded up when required.

Reference is made to Newton's Specification No. 2003, A. D. 1857.

[Printed, 19/1 Drawing.]

A. D. 1860, October 25.—No. 2606.

CAMBRIDGE, WILLIAM COLBORNE.—HARROWS.

Improvements on No. 972, A. D. 1859.

"The frame of this class of harrows consists of parallel  
" beams connected together by cross tie rods which run  
" through the beams and tines, tubular pieces being strung  
" on to the tie rods to gauge the distance apart of the beams."  
In the improved harrow the beams are made of iron shaped like a C, and the tine has a square head on one side which fits in between the flanges, it being secured by tie rods as above. The tines are made of oval-shaped bars, or "rods rolled with  
" taper or bevelled edges," the bar being cut into lengths sufficient for two tines, and this piece divided by a diagonal cross-cut, so that a point is formed on each half. The upper end is squared up, and the head welded on.

[Printed, 19/1 Drawing.]

A. D. 1860, November 1.—No. 2676.

HARRATT, CHARLES.—"Machinery used in giving motion to  
" a shaft or axis used in propelling vessels, ploughs, and  
" machinery."

The invention consists principally in a method of arranging a steam engine so that it drives a shaft which is simultaneously acted on by manual power. A digging apparatus is described. It consists of a sort of curved spade formed like a grid, and mounted horizontally on a vertical lever pivotted at the rear of a wheeled frame carrying a steam engine. The lever vibrates backwards and forwards, and at each stroke the spade scoops up a portion of soil. An upward motion is then given to the lever and spade, and the earth is forced against a projecting part of the frame in front, and driven through the openings in the grid. The steam engine, which is mounted on the front part of the frame, operates a lever "whose fulcrum" "is a circular hook or holdfast which slips one way and holds the other like a windlass or ratchet drill; this hook encircles the axis of the hind wheels." There are two other levers "having the same fulcrum" and worked by manual power. The power thus applied drives a wheel on the spindle carrying the spade lever, by means of a band. Other levers also act on this spindle, which is mounted so as to rise and fall vertically in its bearings, and give it the up-and-down movement referred to above.

[Printed, 1s. 4d. Drawings.]

A.D. 1860, November 5.—No. 2709.

LANCASTER, JOHN. — "Mowing and reaping machine."

The invention consists in enabling a plough to be transformed into a reaping machine. A bearing wheel is fitted to the plough frame, so that it balances thereon. By suitable gearing this actuates a cutter, carried by a bar secured to the frame at right angles thereto. At the end of this bar is a "raising bar" with a wheel. A divider is also fitted at the end of the bar. The plough beam is jointed, and the joint is secured by a pin when the apparatus is used as a plough. "When used for reaping the ploughshare is taken off and a wedge-shaped one put on, and instead of the bridle a tapered cap is used. The mould board is "moveable and of any convenient shape." A rod and platform may be fitted on if required. The apparatus can be drawn from either side, or pushed by a pole behind. A rake is fitted to swivel across the platform.

[Printed, 6d. Drawings.]



A. D. 1860, November 5.—No. 2710.

RIDLEY, JOHN.—(*Provisional protection only.*)—"Reaping and mowing machines."

The following is the whole Provisional Specification:—

"My invention consists in the employment of knives or cutters attached to an endless belt passed round sheaves or pulleys with one cutting edge toothed or serrated, and the other plain, in order to suit different crops to be cut. The belt must be driven in the direction to present the plain edge for grass and green crops, while for ripe corn and similar crops the belt must be driven in the contrary direction to present the serrated edge.

"My invention further consists in a means of communicating motion from the main wheel of the machine to one of the pulleys, and thus to the endless knife or cutter belt. For this purpose I place upon the shaft of the said pulley a double conical wheel or drum, the two parts of which are capable of being fixed at different distances from each other. Between these and in contact with both of them is the main wheel of the machine. By varying the distance apart of the two cones steel keeping them both in contact with the main wheel are varied in proportion, and the speed of the pulley and driving belt are varied in like proportion."

Patented, 4th Nov. 1860.

A. D. 1860, November 6.—No. 2720.

PEARCE, WILLIAM, and BOWLES, EDWARD.—(*Provisional protection only.*)—"Apparatus for ploughing land."

The following is the whole Provisional Specification:—

"This invention consists, firstly, in combining a share of steel or iron with the common plough for the purpose of sub-soiling. The share is fixed to a stem or bar which slides in a groove fixed to the framework of the plough, and in which socket the stem or bar can be fixed at any suitable height by means of set screws or other similar contrivance; the share or subsoiler can thus be adjusted to work to any depth according to what the nature of the ground may require.

"Secondly, by attaching one or more wings or knives to the side or on the face of the turnfurrow for the purpose of cutting the furrow in sheets, and thus leaving openings for the penetration of air, frost, and rain during winter."

Patented, 4th Nov. 1860.

A.D. 1860, November 26.—No. 2890.

ROBERTS, SAMUEL.—Harrows.

Improvements on No. 1771, A.D. 1860. Two sort of rotary harrows are described.

1. Two circular frames are set side by side, and connected by a cross beam, as described in the former Specification. The teeth are curved, those of one harrow in one direction, those of the other in the other direction. The horse tree is attached to the draught bars by universal joints. These bars are "made to the same angle." The "rims of the arrows are formed of angle iron or ordinary bar iron; they can be turned edgewise, thus enabling the harrows to run as wheels" the cross bar forming the axle-tree. The object of this is to enable the harrows to be conveyed from place to place. A single frame with curved teeth may also be used.

2. Two frames are mounted one above the other on the same vertical spindle. The teeth of the upper frame work outside those of the lower one. The teeth on the two frames are curved in opposite directions. "The top harrow of the compound or double harrow rotates round an eccentric fixed on the axis and within a socket to ensure a rotary motion of both harrows." "In some cases," says the patentee, "I introduce between the arms a roller with spikes or spiral blades or a series of circular cutters, either plain or toothed."

[Printed, 8*l*. Drawing.]

A.D. 1860, November 28.—No. 2920.

GRAFTON, HENRY.—(*Provisional protection only*).—"Applification of machinery to the cultivation of land."

The "invention relates to cultivating land by means of a carriage carrying its own motive power, of great breadth, supported on either side by a series of several "broad wheels." "By reason of the great number of wheels and the length of line extended over by the two series of wheels, the carriage has every tendency to move in a direct line, so that the wheels may always be propelled back and forth over the same lines of ground before traversed." "These lines of way may be rendered hard by burnt ballast or otherwise," but this is not generally required. The ploughs, &c. are attached to this carriage. At the headlands there is a

"subway and carriage or carriages" on which the platform is traversed sideways. The carriage is steered by turning "some" of the leading wheels" and also by "applying a greater" steam or other power at one side of the carriage than that at "the other side."

[Printed, *4d.* No Drawings.]

A.D. 1860, November 28.—No. 2921.

GRAFTON, HENRY.—"Machinery for cultivating land."

A large carriage frame is mounted on two sets of wheels, one at each side, driven by an engine or engines on the carriage. The wheels travel on endless railways formed of flexible material with or without solid pieces affixed thereon, and running over drums which lay it down and take it up before and after the wheels. The wheels are fitted with "flexible tyers" of bags or cushions of india-rubber, inflated with air or filled with water. Tilling implements are attached below the frame. The apparatus travels across the field, being steered by an apparatus for turning the drums of the endless railway. It is traversed along the headlands by being mounted on a low truck or trucks, on which it is moved as required. "Track clearers" are fitted in front of the wheels.

[Printed, *10d.* Drawing.]

A.D. 1860, December 1.—No. 2953.

AUSTIN, JAMES.—"Apparatus for ploughing or cultivating "land," &c.

The first part of the invention relates to improvements on No. 72, A.D. 1858. In that Specification a ploughing machine was described in which "the ploughs are arranged to traverse" "by means of endless chains over frames which extend" "laterally from the backward end of the engine frame." In the present invention, "only one frame with its duplex traversing" "ploughs are used." On this is mounted an engine, and it is supported on broad-flanged wheels the hinder pair of which are driven continuously by a ratchet arrangement on a screw-shaft driving a worm wheel on the axle. The ploughs are mounted on endless chains working over rollers mounted in an adjustable frame. The ploughs "are of the common shape," "so far as coulter, mouldboard and sock are concerned. The

“ beam is about three feet long, and from the middle of it  
 “ hangs the curved prong, on which is fastened the mould-  
 “ board and sock.” Rollers on the beam work in guides in  
 the frame. The endless chain is driven by a suitable arrange-  
 ment of belting from the engine.

The second part of the invention refers to improvements in  
 steam engines.

[Printed, &c. No Drawings.]

A. D. 1860, December 10.—No. 3026.

**BROOMAN, RICHARD ARCHIBALD.**—(*A communication from  
 Donald Mann.*)—“ Implements for digging and breaking up  
 “ the soil.”

An endless chain carrying spikes is arranged to work over  
 horizontal drums mounted in a frame on a suitable wheeled  
 carriage. The frame is pin-jointed to the front of the carriage  
 and has on its hinder end a toothed quadrant, with which a  
 pinion engages, so that the frame can be raised or lowered.  
 There are three drums, two large and one smaller, arranged  
 with their axes in the same inclined line, with the small drum  
 nearest the ground. The object of this is to cause the spikes  
 to turn more rapidly as they leave the ground.

[Printed, &c. Drawing.]

A. D. 1860, December 17.—No. 3098

**EDDINGTON, ALFRED.**—(*Provisional protection only.*)—  
 “ Draining ploughs.”

The following is the whole Provisional Specification :—

“ This invention has for its object improvements in draining  
 “ ploughs. For these purposes the coulter, in place of being  
 “ raised and lowered by the means heretofore employed, is  
 “ arranged to be raised and lowered by means of a screw and  
 “ screw nut. The coulter, when rising and falling, is guided  
 “ by means of a roller in front and also a roller behind; a  
 “ screw nut is by preference fixed or attached to the coulter,  
 “ and the screw which raises and lowers the coulter turns in  
 “ suitable bearings carried by the beam or framing of the  
 “ plough. In constructing the beam two plates of iron  
 “ running from end to end are used, having wood between  
 “ them, the whole being combined by bolts and nuts. The

“ wood does not extend from end to end of the plates, but  
 “ leaves spaces for the reception of blocks of iron which are  
 “ fixed between the ends of the plates, and these blocks rise  
 “ up above the other parts of the beam. Through each of  
 “ these blocks one end of a cranked pin passes, the projection  
 “ forming a bearing in which such end of the cranked pin may  
 “ turn. The other end of the cranked pin passes through an  
 “ enlargement on the axle, so that the axle may turn on such  
 “ end of the cranked pin, by which means a universal joint is  
 “ produced, and provision is made for causing the fore and  
 “ hind axles to ‘lock.’ ”

[Printed, 4d. No Drawings.]

## 1861.

A. D. 1861, January 2.—No. 8.

**BELFIELD, JOHN FINNEY.** — “Reaping and mowing machine.”

The cutters consist of knives fixed to an endless chain working over pulleys. Above this chain is a similar chain carrying curved prongs, and this runs in the opposite direction to the first chain. Below the knives is a row of fingers. The cut crop is received on an inclined endless apron running over rollers. The machine when at work is pushed from behind by horses. It is supported on one large bearing wheel and two sledges. These sledges may be turned from side to side by a lever for steering purposes.

[Printed, 10d. Drawing.]

A. D. 1861, January 11.—No. 72.

**HOOPER, HENRY THOMAS, and GERRANS, WILLIAM.** — “Machine for distributing manure on lands.”

A cylinder mounted on a transverse revolving shaft in a carriage is divided into vertical compartments. Each compartment has a hinged door, secured by a catch for the admission of manure, and openings closed by slides through which the manure is distributed on the land.

[Printed, 4d. Drawing.]

A.D. 1861, January 19.—No. 154.

**MANN, DONALD.**—"Rotary spading and digging machines."

A frame supported on wheels has mounted within it a second frame. This inner frame carries three transverse cylinders, over which endless chains carrying forks or tines work. As the machine is drawn along, these tines enter the ground and thus revolve the cylinders. The three cylinders are arranged with their axes in a diagonal line, the lowest being much smaller than the other two, so that the angle which the tine makes with the surface of the ground is more rapidly changed. The cylinder frame is pivotted to the front of the outer frame, and is raised by a rack and pinion behind, so that the depth at which the tines work is adjustable, or they can be entirely raised from the ground. Any other suitable method of raising the inner frame may also be used. For heavy ground the implement may be weighted.

[Printed, 10d. Drawings.]

A.D. 1861, January 25.—No. 201.

**BROOMAN, RICHARD ARCHIBALD.**—(*A communication from Jean Louis Duwiquier.*)—(*Provisional protection only.*)—

"Reaping and mowing machines."

The following is the whole Provisional Specification:—

"This invention relates to the construction of reaping and  
"mowing machines suitable for being driven by hand, but  
"horse power may be applied. The reaping and mowing  
"machines are alike, except that for reaping the implement  
"is provided with a frame for laying the cut crop or other  
"ripe corn at the side. The machine is provided with one  
"wheel only, and the main feature in the invention consists in  
"obtaining the motion of the cutting blades from cams or  
"similar projecting surfaces on the felloe of the wheel. A  
"roller on the end of a horizontal lever centered on a fixed  
"stud on a cross bar of the frame is made to follow the cam  
"surfaces on the felloe, and through the other end of the  
"lever a to-and-fro motion is imparted to a curved frame  
"extending across the machine to which the cutters are  
"affixed. The machine is intended to be pushed forward so  
"as to present the cutting apparatus to the crop, which in  
"reaping machines is delivered at the side by means of a  
"hinged frame. The machine rests at front on shoes, &c.



" which screws for regulating the height of the cutters from  
" the ground are applied."

[Printed, &c. No Drawings.]

A.D. 1861, February 22.—No. 452.

CUTHBERT, ROBERT, and CUTHBERT, WILLIAM.—" Reap-  
" ing machines and grass-mowing machines."

The object of the invention is to counteract side draught.  
This is effected by making the driving wheel a frustrum of  
a cone, set so that it tends to make the machine move in a  
direction away from the standing crop, and thus to counteract  
the drag of the cutting apparatus.

[Printed, *10d.* Drawing.]

A.D. 1861, February 25.—No. 475.

SALLOWS, CHARLES. — (*Provisional protection only.*) —  
" Improving the action or motion of the Kent brush drill at  
" present used in agriculture."

The following is the whole Provisional Specification :—

" The brush drill at present used in Kent in agriculture,  
" and called the Kent brush drill, has its beam attached to  
" the front carriage of the machine in such a manner that  
" whilst the drill is being worked the front iron of the beam  
" is fixed in its mortice, and when the drill goes over rough  
" land the shares of the brush drill on one side will be raised  
" out of the ground, and on that side so lifted up, the seed  
" will not drop into the land under cultivation, but can only  
" fall upon the surface, besides the want of action alluded to  
" will strain the drill and often break it.

" The invention for improving the action or motion of the  
" Kent brush drill, and now sought to be patented, is an  
" improved method of attaching the beam to the front of the  
" drill carriage by rounding the front beam end to pass  
" through an eye of the standard, which will give the beam of  
" the said Kent brush drill, when working, a rotary action  
" or motion, and such rotary action or motion of the beam  
" will cause the brush drill, now used in Kent for all sorts of  
" grain, to keep its own level, and whilst being worked to fall  
" into the hollow parts of the land in course of being drilled,  
" which hollow parts have not hitherto been properly sown by  
" the brush drill now used in Kent."

[Printed, &c. No Drawings.]

A.D. 1861, February 25.—No. 476.

SMITH, WILLIAM GALE. —(*Provisional protection only.*)—  
“Cutting apparatus of harvesters.”

The following is the whole Provisional Specification :—

“It consists in constructing the cutter bar and the cutter sections or knives in such a manner that by the arrangement and operation of suitable devices the knives may be easily withdrawn from, or inserted in, and firmly secured to the cutter bar. I construct the cutter bar of two plates of the necessary length separated and secured together by a short plate at each end. The open space between them is in width of the thickness of the butt or tail piece of the cutter sections; this butt is bevelled or dovetailed so that the extreme end is wider than where it joins the knife part; when in position for action this fits into the bevel in the side of one of the short plates and of the movable and adjustable shoe between each butt. Each shoe has a slot running in the direction of the bar for a pin secured to one or both the long bars, on which it slides, and by which it is restrained. The inner side of the other short plate, as well as the side of the shoe next to it, is bevelled so as to receive a wedge or key, which, when removed, allows any or all the cutter sections to be taken out by pressing the shoes in the proper direction on their pins. When the knives are to be secured, they with the shoes are driven to their places by forcing the wedge or key into its seat between the two plates the requisite distance, where it is properly secured by a pin or otherwise. I do not limit myself to this particular form of constructing the adjustable shoes and tail pieces of the cutter sections, but claim any other form by which they can be secured by a single wedge as described.”

[Printed, *ad.* No Drawings.]

A.D. 1861, February 25.—No. 484.

HOWARD, JAMES, and BOUSFIELD, EDWARD TENNEY.—  
“Windlasses and implements applicable to steam cultivation.”

1. Improvements in winding drums and windlasses, referring to a method of putting the brake on the giving off drum simultaneously with throwing the other drum into gear at the end of the bout. The windlass is distinct from the

engine and mounted on a wheeled frame. It is anchored by means of blades on the draught shafts of the frame.

2. Cultivators are formed with a suitable frame to which are fitted "double-pointed or double-edged tines or shares which " will act in either direction." These are mounted in sockets so that "they will be free to rock slightly on their beams by " the action of the draught." The effect is that when the direction of motion is reversed, the points formerly at work are thrown up out of the ground, and the others brought into action. The implement is mounted on two pairs of steering wheels, one pair in front and one behind. The pair used during each bout is operated by a lever, the other pair being fixed by a pin. The tines are mounted on fulcrum pins, and the extent of their movement is regulated by set screws. The wheels have preferably V-edged rims.

3. The following part of the invention is described in the Provisional Specification, but no reference thereto is made in the Final.

It relates to double-action ploughs. The frame is fitted together by screws, so as to be capable of expanding. "The " beams each carry on their opposite sides a plough body, one " being made right-handed and the other left-handed." The frame "is supported at each end of a carriage fitted with " wheels." "To each end carriage is fixed a rack lever," "to " raise and depress the plough bodies." At the end of the bout the ploughs are raised out of the ground, and the beams or the plough bodies rotated.

[Printed, 7s. Drawings.]

A. D. 1861, March 1. — No. 529.

TOLHAUSEN, FREDERICK. — (*A communication from Philippe Durand.*) "Machine for gathering and bunding the sheaves or gavels of corn or other harvest produce.

Improvements on No. 720, A. D. 1858.

The following is the description given in the Provisional Specification. It corresponds with that illustrated by drawings in the Final.

"This corn binder is placed at the back part of the table or " platform of the reaping machine. It is composed of a pair " of compasses shaped like calipers, having two curved legs, " but which are articulated or jointed in the middle of their " length so as to be able to straddle flat down upon the plat-

“ form These callipers are provided at each of their ex-  
“ tremities with a pair of pliers forming a kind of hands or  
“ fingers which open and close by means of a spring. When  
“ the callipers straddle on the platform and their extremities  
“ touch it, the said springs meet the platform, and causes said  
“ hands or fingers to open so as to receive the tie which is pre-  
“ sented to them by an operator seated on a suitable seat,  
“ which tie is for binding the gavel as it is furnished by the  
“ reaping machine and placed on the said tie, I then set the legs  
“ of the callipers in motion, and bring them together by means  
“ of an endless rack developed in the shape of a screw on a  
“ spindle, the upper and under sides of the screw thread being  
“ furnished with a succession of teeth into which a proper  
“ bevel pinion is set to gear. By this motion the said hands  
“ which are closed are brought together and open by pressing  
“ against each other. Thus the ends of the tie are brought  
“ together and taken hold of immediately by a pair of nippers  
“ which occupy a perpendicular position to the platform, and  
“ are set in motion by the said screw rack, which also stands  
“ perpendicular to the platform. The screw rack thus causes  
“ the nippers to perform two revolutions in one direction,  
“ after which the nippers are opened by a lever, which lever  
“ then works a hook by which the ends of the tie which has  
“ been relinquished by the nippers are drawn in betwixt the  
“ sheaf and the tie in the same manner as is done by hand, so  
“ as to prevent the tie untwisting. Another hook being called  
“ into action causes the end of the tie to describe one half turn  
“ horizontally, by which it is further secured. This operation  
“ having been accomplished, the legs of the callipers aforesaid  
“ open out and the sheaf drops on the ground. The operator  
“ on his seat then feeds another tie into the hands or fingers,  
“ which take hold of the same, the twisting nippers with their  
“ jaws open perform two revolutions in an opposite direction  
“ to the preceding one; the rake or equivalent device then  
“ supplies another gavel, and the driving bevel pinion passing  
“ round to and gearing into the opposite rows of teeth on the  
“ screw rack, a lever unites the two legs of the callipers, the  
“ nippers take hold of and close upon the two ends of the tie,  
“ which they twist, and which are then passed under the said  
“ tie as before described by the vertical hook.”

(Printed, Text. Drawings.)

A. D. 1861, March 1.—No. 528.

SOVEREIGN, LEVI LEMON. — *Partly a communication from Guider Huntington.*—“Implement for cultivating land and “ for sowing seed.”

The frame of the implement is mounted on four wheels, two carried by an adjustable standard in front, to which a guiding lever is affixed, and one on each side of the frame. These are not exactly opposite each other, and they are mounted on studs on lever arms so that each is adjustable separately. Each lever is held at any height required by a catch taking into a slot in a quadrant. The adjusting movement of the wheels is such as not to interfere with the gearing driven therefrom. Ploughs or other cultivating implements are mounted on a cross beam below, so that they can be adjusted to any intervals required. A seed and manure box with revolving agitators working therein is fitted diagonally across the frame. This delivers the seed, &c. through apertures closed by a perforated sliding plate adjustable by a screw to funnels and tubes below. A lever is arranged to open and close these apertures without interfering with the screw. An “ordinary broad cast sowing “ box ” may be attached at the back of the frame. For planting “potatoes, beans, or other large grain,” a box is arranged with compartments having an endless web running over rollers, and conveying the potatoes, &c. to a conducting tube. On the web is a revolving brush and over this a fixed wire screen. The machine may be drawn by horses or steam.

[Printed, 10d. Drawing.]

A. D. 1861, March 6.—No. 570.

STATHAM, JOSEPH, and STATHAM, WILLIAM — (*Provisional protection only.*)—“Apparatus for mowing and reaping.”

1. The frame is made of “angle iron” instead of wood.
2. The cutters “are secured beneath a horizontal bar, which “ have a traversing or reciprocating action given to them by “ suitable gearing from the driving wheels, and which may be “ thrown in and out of gear by ‘catch boxes’ and levers. The “ knives or cutters traverse across spaces divided by vertical “ fingers or blades, and are secured beneath a horizontal bar, “ so that the whole flat blade of the cutter has bearings upon

“the plate or bed beneath.” There are “fingers or blades” dividing the spaces much higher than usual.”

3. There are “two bent metallic bars or sledge-like shoes, to which the bar of the cutters is attached, and which is supported at a certain point above the axle instead of upon the axle, as usual, by which means it is kept in more perfect contact with the ground, and is capable of rising and falling with the inequalities of its surface more readily; this sledge or shoe may be adjusted, and with it the cutting apparatus, to any required height from the ground by extra pieces secured under it, or by means of a screw.”

4. The inventors employ “a blast of air produced by a fan and conducted by an air tube, the fan being worked from the driving gearing, the tube to be in advance of the cutters to bring any grass or corn not standing upright into a position to be cut.” There is a single bearing wheel or runner in front of the machine.

[Printed, 4d. No Drawings.]

A.D. 1861, March 14.—No. 536.

HODSON, WILLIAM.—(*Provisional protection not allowed.*)

—“Propelling and steering carriages and also ploughs, and other agricultural implements.”

The carriages, &c., are propelled by “feet” alternately acting against the ground. There are two sets of these, for propelling backwards and forwards. The propelling force may be steam, manual power, &c. The carriage, &c., is preferably steered by a pair of locking wheels in front worked by means of “a number of radial footboards” on the axle of a pinion gearing with a bevel wheel on a vertical spindle fixed on the locking frame. It may also be steered by “one wheel in the front turning upon a swivel, and having a cross bar upon the top with two rods leading from each end to the feet of the driver.”

[Printed, 4d. No Drawings.]

A.D. 1861, March 15.—No. 641.

SAMUELSON, BEBNHARD.—“Machines for breaking-up and cultivating land.”

The implement consists of a cylinder fitted with tines, and mounted in a suitable wheeled frame. This frame has a bear-



ing wheel at each side, adjustable separately from the opposite wheel by a screw or otherwise. There is also a guiding wheel in front. The tine cylinders are in two or more pieces. The tines are secured in sockets "of greater depth than the average" thickness of the cylinder. The "lower extremities of the" opposite vertical guides "in which the bearings of the carrying wheels move are connected by a transverse stay which preferably forms the axle of the tine cylinders.

As a modification of the above, the tine cylinder may be mounted on a lever arm, the fulcrum of which is the axle of the running wheels. The tine cylinder may thus be raised and lowered by "direct leverage."

(Printed, 16*ol.* Drawing.)

A.D. 1861, March 15.—No. 649.

DIXON, GEORGE. — (*A communication from Mr. Hauta-rolne.*) (*Provisional protection only.*)—Ploughs.

1. "Making the pitch of the plough in two pieces bolted together at the top, which allows the beam to be raised four inches higher than is usual without lengthening the plough" and prevents clogging. "The handles are more horizontally placed than in ordinary ploughs" and "only touch the earth at their extremities." "A small iron plate is placed under the beam, and extends as far as the pitch, where it divides into two parts, which pass behind the pitch on each side of it, pressing it at a distance of four inches below the beam. A small piece of iron connects the two branches at the end of which nut screws are adapted to the small piece and to the pitch."

2. "The coulter is arrested when required by means of a rack placed flat on the beam in front of the coulter." "To prevent the ploughshare from wearing out on the roads a shoe of cast iron is employed."

3. The axle is in two pieces connected by a screw so that the width apart of the wheels can be regulated. "When the ploughing is performed by means of a single horse, or with three harnessed abreast, the fore part must be turned in order to pass over the furrow desired, which is effected by means of a piece of wood adapted at the head of the plough, and held by means of a bolt, at the end of which there is a hole for receiving a peg which retains the piece. The latter

" has one or two large holes pierced in each end, and several  
" smaller ones throughout its length. The larger holes open  
" alternately to allow the chain or cord to pass, which chain is  
" placed beneath the head of the plough near the axle, and  
" the smaller holes serve to attach the additional piece above  
" mentioned to the head of the plough, and to regulate the  
" turn."

[Printed, 4d. No Drawings.]

A.D. 1861, March 16.—No. 686.

STEVENS, CHARLES. — (*A communication from Louis Jacques Chatrau.*) — (*Provisional protection only.*) — "Agri-  
" cultural implements."

Improvements on No. 2875, A.D. 1858. A number of improvements are described in the details of the subscribing implement which forms the subject of the previous patent. The tines are mounted in an iron block, and have a supporting "collar." The windlass, &c., for raising the tines is mounted in a special position with regard thereto. Blades of suitable shape may be mounted in "the shaft." A special way of mounting the frame is described.

[Printed, 1d. No Drawings.]

A.D. 1861, March 20.—No. 696.

RIDLEY, JOHN. — "Reaping machines."

The invention relates to improvements on a former invention of the patentee, entitled the "Australian reaping machine." In this the ears of corn are caught by a comb on the front of the frame, and thrashed by flyers behind the comb. According to the present invention there is added to this machine "a knife or cutting apparatus of any suitable form, for the purpose of cutting the straw near the ground." In the apparatus figured, there is a comb and flyers as above. Behind the comb a reciprocating knife is fitted, which may be used or not as required. This, as well as the thrashing apparatus, is actuated from friction discs in contact with the bearing wheels. At the back of the machine near the ground is a cutter, apparently like the cutter of an ordinary reaping machine, which cuts the straw after the grain has been beaten out, or the ears cut off. A "spiral radiating flyer" in a shaft above the cutter, serves to raise the straw and pass it over the cutter.

[Printed, 10d. Drawing.]

A.D. 1861, March 23.—No. 737.

SPENCER, JOHN.—“Construction of harrows.”

The improvements refer to chain harrows, and consist in connecting the rows of links to transverse jointed bars so that the harrow is composed of bars alternating with sets of links. The bars in front are heavier, and they gradually decrease in weight towards the rear. The vertical links are made to alternate and so are the joints in the cross bars. “By this means a more flexible harrow is produced than those now in use.”

[Printed, &c. Drawing.]

A.D. 1861, April 1.—No. 803.

JAMES, ROBERT.—(*Provisional protection only.*)—“Reaping and mowing machines.”

1. The fingers have cutting blades fixed on them, and the knives work over them. The blades are removable.

2. An endless web receives the corn from the cutters and carries it back to transverse webs of which the hindmost one travels faster than those in front of it to deposit the corn in the proper position. The webs have bars across to keep them stretched, those on the first web being serrated. To lay the corn in bundles, the webs deliver it to “a sort of large fork which is dropped or upset at regular intervals.” The webs are of folded canvas or rubber belts, to allow for stretching. To keep the webs level, when the machine is working on a hill, the platforms carrying the webs are adjustable, being hinged to the front platform and held in any required position by catches.

3. An endless band carrying knives works along the side of the machine, so as to sever any straw entangled with the standing corn.

For mowing, the travelling bands, &c. are removed.

[Printed, &c. No Drawings.]

A.D. 1861, April 3.—No. 818.

WILSON, THOMAS EDWARD.—(*Provisional protection only.*)—“Machinery for agricultural purposes.”

The following is the whole Provisional Specification:—

“The first part of this invention is applicable to those agricultural machines in which a reciprocating or to-and-

“ ‘fro’ motion is required and it consists in making a cam  
 “ or cams with two or more projections to work against  
 “ two points of contact in connection with the frame or slide  
 “ that has to be moved to and fro. These points of contact  
 “ are on opposite sides of the axis of the cam or cams. A  
 “ projection on one side of the axis of the cam or cams will  
 “ push the frame or slide that has to be moved one way, and  
 “ a projection on the other side will push it back again,  
 “ and so on continuously; they will act whichever way the  
 “ cams rotate. The advantages are that less power will be  
 “ required and the wear and tear will not be so much as when  
 “ ordinarily constructed. The second part of my invention  
 “ is applicable to roller grinding machines, and it consists  
 “ in making the rollers between which the substances are  
 “ ground or crushed one with right and the other with left  
 “ hand threads or grooves, so as to produce a wrenching  
 “ motion.”

[Printed, 4d. No Drawings.]

A.D. 1861, April 3.—No. 822.

NEWTON, WILLIAM EDWARD. — (*A communication from William Van Anden.*)—"Machinery for cutting and harvesting  
 “ timg grain, &c."

The invention consists of the following heads:—

1. The cutters are made "of a triangular shape out of thin  
 “ plates of metal, and bent up or disled so as to make their  
 “ lower surfaces concave and their edges assume an angle of  
 “ about ten degrees (more or less) so that when ground on  
 “ the concave sides of the cutters, the grinding operation  
 “ will produce a sharp and thin cutting edge by the single  
 “ operation of one only of the cutters being ground."

2 "Adjustable clamps or guides" are "attached to the bed  
 “ piece or shoe in which the cutter bar vibrates so that as the  
 “ edges of the cutters are worn away the clamps may be  
 “ adjusted by means of binding screws to hold the cutters  
 “ in contact with the fingers of the shoe or cutter bed, and  
 “ thus keep them in working order."

3 "Combining the frame of the machine with the shafts  
 “ or pole by means of fixed arms attached to the lower side of  
 “ the axle-tree for the purpose of making the machine self-  
 “ adjustable in overcoming obstructions to the forward progress  
 “ of it."

4. "So arranging the several parts of the machine that all the above mentioned improvements may be combined in one so as to constitute a complete mowing machine."

[Printed, 10d. Drawings.]

A.D. 1861, April 3.—No. 824.

BAMLETT, ADAM CARLISLE.—(*Provisional protection only.*)  
—"Reaping and mowing machines."

1. Improvements on the "Hussey" machine.—"Forming the framework of three longitudinal bars" "fitted together, and connected with the finger bar so that the ends do not project in front of it." Two of these bars are in the usual position, the third is "inclined from the rear down to the lowest level of the finger bar." There is "an additional transverse piece above the frame in front," and a "fixed or swivel wheel at the rear." This wheel and one mentioned in No. 1730, A.D. 1860, are to be used for adjusting the heights of the cutters.

2. "Placing the bevil wheel close to the framework while the pinion and crank shaft are mounted at the top instead of at the side."

3. "Application of a swivel wheel at the back part of the Hussey machine to lift the knife from the ground."

4. "Fixing a rod or rods or boards to the finger bar or fingers of mowing machines, which project over the finger bar backwards" to distribute the cut grass.

5. "Dovetailing the knife bar on its front edge into the fingers or its other supports to cause it to work steadier, and prevent the points of the knives rising" "Also casing in, or partially casing in, the knife bar on its under side as well as its front edge to prevent choking"

6. Applying springs to the dividers to keep them down, also to the fingers.

7. Using different sets of driving wheels for mowing and reaping, one plain, the other ribbed on the rim

8. The cams for driving the cutters are made "in one solid piece," and are fitted on the driving wheel shaft

9. The delivery rake is worked by eccentric gear "to give it a quicker movement when near the finger bar than when delivering the shaft."

10. The gearing of machines which have the cutters in the rear of the driving wheel is arranged so as to be "all on the inside of the frame." A small wheel is fitted so as to act as a guard to the knife."

11 There is an "inclined truss bar fixed to the rear edge of the finger bar on its under side."

[Printed, *ad.* No Drawings.]

A.D. 1861, April 19.—No. 967.

RIDLEY, JOHN.—(*Provisional protection only.*)—"Cutting apparatus for reaping and mowing machines."

The following is the whole Provisional Specification:—

"My invention consists in the construction and employment of cutters which are fixed on a horizontal shaft, to which rotary motion is communicated in any suitable manner. Each separate cutter is composed of a disc, from one side of which extend two inclined curved blades which spring from close to the side and rise gradually to the farthest point from the disc, when the line is carried down again close to the disc, then the next blade rises and is carried on till it attains its greatest height, the line is then carried down, and thus the circumference of the disc is occupied. Although I give the preference to two blades only being made to occupy the circumference, one only, or three or more may be used. The edge of the blades is serrated by preference, but a simple cutting edge will be found sufficient for some crops. The cutters are set at equal distances apart, and are so placed with respect to the holding fingers that the inclined blades, on being made to rotate come in contact or nearly so with them, and perform a scissor-like cut. The cutters are enclosed in a tube, about one-third, more or less, of the circumference of which is removed to allow of the crop coming under the action of the blades. In some cases I employ spiral blades instead of the blades first described."

[Printed, *ad.* No Drawings.]

A.D. 1861, April 29.—No. 1072.

THONIER, FRANÇOIS ANTOINE. — (*Provisional protection only.*)—"Reaping machines."

The following is the whole Provisional Specification:—

"This invention will show that a single man, aided by a horse or a pair of oxen, can reap wheat, barley, and other



“ agricultural produce ; that the work may be well done on  
 “ uneven ground ; that the machine will separate the cut from  
 “ the standing (stubble) stalks, and turn the former out of the  
 “ course of the machine, and facility will be afforded to move  
 “ the machine from the barn to the field without risk of break-  
 “ age. I construct my machine, say, with a metal grating  
 “ in form of a comb, through or between the teeth or open-  
 “ ings of which enter the stalks of the standing corn to be cut,  
 “ which meeting the sweep of a saw blade (with large teeth)  
 “ falls, and is cleared by an arm piece from the stubble and  
 “ passed over to the left so as to lay it in the usual heap for  
 “ drying. A lever (depressed at pleasure) causes the grating  
 “ to rise and clear any obstruction, such as tree stumps, large  
 “ stones, and other. Motion is communicated to the saw blade  
 “ by means of pulleys passing from and actuated by the  
 “ rotary movement of the axle of a light carriage framing,  
 “ which holds together all the parts of the machine.”

[Printed, 4d. No Drawings.]

A.D. 1861, May 4.—No. 1125.

HOMERSHAM, WILLIAM COLLETT.—“ Engines and imple-  
 “ ments for ploughing and cultivating land.”

1. The first part of the Specification refers to agricultural  
 engines.

2. A cultivator is formed with tines mounted so as to be  
 raised or lowered by racks, worked by suitable gearing. The  
 tines can also be turned to act in either direction. This is  
 effected by removing a key, by which the tine is held. The  
 tines are of T-iron, preferably with the front cutting edge of  
 steel. The frame is supported in a pair of wheels at the centre  
 and a wheel at each end. The tines “are so arranged and  
 “ adjusted as to cause all the strain and weight to rest on the  
 “ two centre wheels and the wheel that is in advance.”

3. The junction of the ends of traction ropes is made by the  
 employment of “hollow taper spindles and tapered tension  
 “ pins, the ends of the ropes being inserted in the said  
 “ spindles, and spread out so as to fit tightly in the hollow  
 “ part thereof, by driving a wedge or wedges into the core of  
 “ the rope.”

[Printed, 10d. Drawings.]

A.D. 1861, May 6. -No. 1132.

AGER, GEORGE.—"Apparatus for breaking or opening land."  
Improvements on No. 1062, A.D. 1860.

A frame is mounted on running wheels. To the front of this frame a second inner frame is pivotted, this inner frame being fitted with a rack gearing with a pinion on the outer frame, so that the inner frame can be raised and lowered. A tine wheel is mounted on a transverse shaft on the inner frame, and has rotary motion given to it by suitable gearing. In front of this is a second similar tine wheel, the teeth of which clear the first and pulverise the soil further. In front of this a third tine-wheel may be placed to clear the teeth of the second.

[Printed, 6d. Drawing.]

A.D. 1861, May 13. No. 1219.

SMITH, WILLIAM.—"Cultivators, ploughs, and apparatus  
"used therewith."

1. A drill to be worked by steam power is described. The frame is carried by a pair of large wheels behind, and a small pair on a vertical standard in front. A pulley on this standard is driven by an endless band from a pulley on a vertical shaft at the centre of the frame. On turning this by a handle, the implement is steered. The traction ropes are attached to a collar prevented from sliding on the standard of the steering wheels. They pass between two projecting side pieces carried by the standard, so that in turning at the end of a bout the rope acts against either of these pieces and tends to turn the steering wheels into the position for turning. There are also two bolts across in front between the two side pieces, and these pieces can be raised and lowered by a link, so that the drag of the chain may come against either the upper or the lower bolt, and thus raise or depress the front of the machine. "Cultivating tines" are employed to form the drills, and each tine is mounted on the hinder end of an arm pivotted on a transverse shaft about the centre of the frame. This arm is kept at a suitable height by means of a wheel on a stem sliding in a socket in the arm. Behind the tine is a "presser," and behind this again a seed tube connected to a seed box of the usual character. Apparatus for distributing manure may be

added if required. A harrow may be attached behind the machine, and a roller also.

2. A plough is formed with two plough-bodies on opposite sides and ends of a short beam. There is a guide wheel with a steering handle at each end. At the end of the beam the implement is thrown on its side by a hand lever fitted into an aperture provided therefor, and as it commences its traverse in the opposite direction, it is raised on its other side, so that the plough which was before uppermost comes into action.

3. Instead of a single large pulley on the anchor, three smaller pulleys are used, set so that peripheries form the curve required.

4. To carry the rope across the field pulleys are used mounted on rockers, so that the action of the rope carries them into the position required.

[Printed, 1s. Drawings.]

A. D. 1861, May 13.—No. 1221.

HORNSBY, RICHARD, junior. — "Ploughs and other agricultural implements."

The improvements relate principally to lever neck ploughs. Instead of the lever neck being in one piece of wrought iron, the head or part entering the share is of cast metal, preferably cast on the wrought iron part. The head is strengthened on the land side "by forming a lump on it, and the face of this lump is brought up flush with the face of the share, and the land side of the share." "The shares to fit the lever neck so formed are notched out in order to receive the lump on the head; this notch comes at the back of the land side of the share and intermediate between its top and bottom surfaces." Similar shares may be used with ploughs with fixture heads, and there is either "a lump on the land side of the head to come up flush with the land side of the share," or a continuation of "the share beyond the back edge of the head."

The handles are of iron, bolted to a wooden beam.

Ploughs with an iron body are constructed so that the "fore part of the frame or body" fits in "a socket in the share," the front of which has "a head to receive the share" or it is fitted to receive a lever neck.

To prevent the wheels clogging they are made of two wrought-iron discs with a tyre, thus offering no open spaces. There is "a bushing to the stem which carries the wheel." "At the lower end of the stem the bushing is fixed also so that it can be readily removed and replaced." "It consists of a tube through which the pin or axis of the wheel passes." The end of the pin is suitably secured.

The drawing attached to the Specification principally shows different shape of the lever-necks, shares, &c.

In the Provisional Specification reference is made to a method of mounting wheels for ploughs, &c. The bar of the "wheel slide" is of wrought metal, and has a cast-iron socket thereon. The socket on the beam is of cast iron, and is bolted to the beam, when the beam is of wrought iron. No reference to this appears to be made in the Final Specification.

[Printed, 10d. Drawing.]

A.D. 1861, May 14.—No. 1232.

HOWARD, JAMES, and BOUSFIELD, EDWARD TENNEY. —  
(*Letters Patent void for want of Final Specification.*)—

"Apparatus to be employed in steam cultivation."

1. Improvements in "transmitting rotary motion from the steam engine to the windlass."

2. "Reducing the vibration of the driving shafts of windlasses."

3. Improvements in snatch blocks. On the bed-plate frame is bolted a "hollow cast-iron block or [?] on] a solid wood centre, which centre is to receive the grooved guiding pulley." "Over this centre" is bolted "a cap having a receptacle for lubricating material." There are shifting guards for keeping the rope in its place. The block travels on wire ropes stretched along the headlands, or it may be mounted on a wheel carriage running in a furrow along the headlands.

4. In working harrows, rollers and clod-crushers by steam power, the inventors "crank vertically" the frame and fit wheels thereon." The draught ropes are attached to the end of the frame, and the strain thereon serves to bring one set of implements into work and raise the others. "The wheels are steered alternately" as in No. 484, A.D. 1861.

5. Double-ridge ploughs are made with "double bodie" and a frame like that described in No. 484, A.D. 1861. The

shares "point in opposite directions, and the implement can "therefore be moved indifferently in opposite directions." The breasts are formed "in one piece."

[Printed, 4d. No Drawings.]

A.D. 1861, May 16.—No. 1249.

GILLBEE, HENRY.—(*A communication from Napoleon Gorel.*)—"Reaping machines to be called 'comb beater'."

The implement is mounted on a pair of wheels and pushed from behind by handles which can be adjusted in height to suit the operator. Along the front of the machine is a horizontal comb which, as the machine is pushed along, catches and tears off the ears of corn. These fall into a box behind in which is a revolving toothed beater. By this the corn is thrashed out, and the grain falls into a receptacle behind. The height of the comb is adjusted by a rack.

[Printed, 6d. Drawing.]

A.D. 1861, May 16.—No. 1252.

CLAY, CHARLES.—"Implements for cultivating land."

Improvements on No. 2803, A.D. 1857. The cultivating tools are mounted on two sets of two bars mounted across a frame, so that each bar is capable of axial motion. The cultivators on two of the bars act in one direction, those on the other two in the other direction, and they are linked together by connecting rods, so that all the cultivators of each set enter and leave the ground together. The drawing of the implement in either direction causes the required set of tools to be drawn into the ground, the other set being correspondingly raised. The implement is drawn by traction ropes attached to chains or rods connected to a central transverse bar. The frame is mounted on a single pair of wheels at its centre, and for steering the axles are "arranged to perform a locking motion." The axle of each wheel is carried by a block pivoted on a vertical bar and sliding thereon. These blocks are connected by parallel bars passing across the machine, and by these the wheels can be simultaneously turned. At each end of the machine there are "feet" with adjustable stems, to keep the end of the frame off the ground. The stems of the cultivators when at work rest against transverse bars and are supported thereby.

[Printed 1d. Drawings.]

A.D. 1861, May 16.—No. 1254.

BOWHAY, JOHN LEAKEY.—(*Provisional protection only*).—  
"Reaping and mowing machines."

This invention relates to a method of arranging the cutting mechanism, also to dispensing with guards over the top of the knife.

1. The front edge of the knife is adjusted "firmly to the under cutting edge by a lever action brought to bear upon the front edge of the travelling knife bar. This lever action is obtained by having two or more short cams secured to the under blade which rests upon the fingers and upon the front edge of the top knife; these arms extend back under the main bar, and are depressed by set screws."

2. Or "the lower blade may be clamped firmly to the fingers, and the back edge of the upper knife bar may be pressed upwards by a spring or lever action and set screws; or the under knife may be dispensed with, by having a steel finger with a lever fixed thereto, and brought back with a catch in the knife, and extending to the main bar, where it is acted upon by set screws; or a finger with a rib or slot in it may be employed for the front edge of the knife to work in," with a spring at the back of the knife.

(Printed, &c. No Drawings.)

A.D. 1861, May 21.—No. 1296.

TASKER, WILLIAM, the younger.—"Apparatus for tilling or cultivating land."

The improvements relate to windlasses or winding drums to be employed separate from the engine.

1. A frame with bearing wheels and traction shafts carries a pair of winding drums with the main driving pulley between them, the axes of all three being in the same straight line. On each side of the pulley a pinion gears with another on a short spindle fitted in the face of the winding drum on that side. A second pinion on the same spindle gears with an internal spur wheel fixed on a brake wheel running loose on the main axle. Thus while the brake wheel is free it is merely carried round, and no motion is imparted to the drum, but when the wheel is locked by a friction strap, the spur wheel on it becomes fixed and that on the drum is carried round (sun and planet motion) thus imparting the required movement to the drum. Each drum is thrown into action alternately. The arrangement may be modified by using a sliding clutch or friction cones to



throw the pinions into or out of gear with a spur wheel fast on the main axle.

2. The driving pulley is on a shaft parallel with that of the drums and can be raised and lowered at each end by a lever to throw pinions thereon into and out of gear with pinions on the drum spindle.

[Printed, 1s. Drawing.]

A.D. 1861, May 22.—No. 1301.

DE BEAUMONT, HENRY BOUTILLIER. Ploughs.

The share, mould board and coulter are formed in one piece, and work on a pivot on the frame, so as "in returning to throw the soil to the side opposite to that to which it has before been thrown." There are two "knives" or "cutters" bolted to the share at right angles to each other, and the mould board, &c. turns "through the quarter of a circle, so that the coulter or vertical cutter of one traverse becomes the share or horizontal cutter of the return traverse." The parts are held in the position required by an adjustable link. The implement may be used as a cultivator by "fixing the parts in an intermediate position," the cutters "being then inclined to an angle of forty-five from the vertical." In a modified form of the invention, the mould board is "of a screw shape."

[Printed, 6d. Drawing.]

A.D. 1861, May 25.—No. 1321.

WALLER, HENRY. (*Provisional protection only.*)—"Improved horse rake."

The following is the whole Provisional Specification:—

"The principal novelty in this invention consists in mounting the teeth or tines upon a detached bar placed behind the axle (the axle running through from wheel to wheel, so that the tines are thrown further back, and the weeds, hay, or other materials collected thereby are not so liable to entanglement with the wheels as when the tines are mounted in the usual manner. The tines are raised from the ground when required by means of a cranked lever with the handle projecting forwards, so that only one person is necessary to attend to the same and lead the horse. When it is desired to keep the tines raised altogether, the handle may be depressed and fixed in that position by means of a pin or screw."

A.D. 1861, May 27.—No. 1332.

HOLBECH, WILLIAM BOSWORTH.—“Apparatus for sowing seed”

The seed is delivered in the usual manner from a seed box by revolving cups to funnels, but instead of these funnels leading down to the drill, they deliver the seed on to a cylinder working in a suitable chamber. Recesses on the surface of this cylinder receive the seed which is carried round thereby and delivered to the drill. The object of this arrangement is to prevent the seed which has been measured out by the cups, collecting again into a continuous stream. To prevent injury to the seed, the cylinder fits loosely in its chamber, and there are scrapers or brushes fitted to prevent the seed being carried round. A spring also fits round the cylinder over the part from the point where the seed is received to the point of delivery. Each cylinder and chamber with the presses corresponding thereto is mounted on a lever jointed to the frame, in the way the presses are usually mounted. A bar is fitted under the lever ends, to prevent the presses penetrating too deeply. This bar is mounted on small wheels, or on a roller, which serves to act on the land. The shafts are pivotted to the frame, and the amount of play controlled by chains, so that the frame may be guided by the steering handles, independently of the shafts.

[Printed, 10d. Drawing.]

A.D. 1861, May 27.—No. 1333.

NICHOLSON, WILLIAM NEWZAM.—“Machines for making and collecting hay.”

1. “Frictional gearing” is used for driving the fork cylinders, in the manner described in No. 1485, A.D. 1854, or otherwise.
2. A fixed wire screen or a rotating roller suitably driven is used to protect parts of the machine from clogging.
3. A worm and worm wheel is used to give longitudinal motion to the fork cylinder to throw it into and out of gear. A cam and proper surfaces against which it acts may also be used.
4. A prong or bar is fitted in front of each bearing wheel, such prongs having “wings attached to them resembling the mould boards of ploughs” to clear the track.

5. The fork heads are connected to the fork cylinder or shaft by springs.

6. The height of the machine is regulated by jointing the ends of the shafts to the frame and holding the joint in any position required by means of a slotted or perforated quadrant.

7. For cutting thistles knives are used which have a "convex (or concave) form on the cutting edge." The knives may be of the sort described in No. 1634, A.D. 1859, or any other shape.

8. A hand or foot lever is fitted near the driver's seat. This operates eccentric quadrants with chains over them, and by these the forks are lifted.

9. The teeth are connected together "in pairs" to give steadiness to them.

[Printed, 10d. Drawings.]

A.D. 1861, May 30. —No. 1347.

**SAVAGE, WILLIAM PRACOCK.**—"Reaping and mowing machines."

Endless chains carrying bars with teeth thereon are mounted on chain wheels on the shaft of the reel, and on a shaft parallel thereto in front thereof. This shaft is so mounted that it can be raised and lowered to cause the teeth to enter below and raise laid corn, or to elevate the apparatus free from the crop when it is not required. The teeth are mounted on pins on the bars, so as to revolve axially thereon, and are broadest at their outer ends to enable them to pass readily under the crop. The front part of the machine is supported on a castor wheel.

Printed, 6d. No Drawings.

A.D. 1861, May 30.—No. 1349.

**GARROOD, CHARLES.**—(*Provisional protection only*)—"Horse-rakes and harrows."

The following is the whole Provisional Specification:—

"This invention has for its object improvements in horse-rakes and harrows. For these purposes each of the tines or teeth is at its upper end mounted on a bar or rod, which is preferred to be hollow, in order to obtain stiffness and

“ strength with the least weight of metal. This bar or rod  
 “ serves as an axis on which each tooth can move or turn in-  
 “ dependently of the others. The bar or rod is arranged in  
 “ such manner that it may be raised or lowered in respect to  
 “ the centres of the wheels and be fixed at different times  
 “ at different distances from the surface of the land, and thus  
 “ the distance from the earth at which the points of the teeth  
 “ or tines of the rake work may be regulated and adjusted.  
 “ The teeth or tines are lifted as heretofore to discharge the  
 “ hay or other matters which have been collected by them.  
 “ The shafts are attached to the axles of the wheels, or to  
 “ the rod or bar on which the tines or teeth are mounted,  
 “ by connecting parts which, by preference, are hollow, in  
 “ order to obtain lightness together with strength and stiff-  
 “ ness. In constructing harrows the teeth or tines are set in  
 “ circles, and by preference in two circles; each harrow is in  
 “ the form of a wheel with radial spokes, on each of which, at  
 “ a distance from the centre, is formed a projection with a  
 “ suitable recess or otherwise to receive the stem of a tooth or  
 “ tine, and the whole of the tines or teeth are secured by a  
 “ hoop, the two ends of which are fastened by a screw bolt.  
 “ In a similar manner the stems of the teeth or tines are re-  
 “ ceived into recesses or otherwise at the periphery or outer  
 “ circumference of the harrow, and they are secured by a hoop  
 “ the ends of which are fastened together by a screw bolt.

[Printed, 4d No Drawings.]

A.D. 1861, June 1.—No. 1379.

RANSOME, ROBERT CHARLES.—(*A communication from Thomas Robinson.*)—“ Reaping and mowing machines.”

The invention consists in “ so arranging these machines that  
 “ the same instrument which removes the crop when cut, from  
 “ the platform to the side of the machine also acts as a fly  
 “ to lay the crop into the fingers.” “ Four or other number  
 “ of arms are mounted on a vertical axis at one end of the line  
 “ of cutters; this axis is driven from the main or driving wheel  
 “ of the machine; the arms are so mounted on the axis that  
 “ they are caused to rotate with it; the ends of the arms  
 “ farthest from the axis are, however, capable at the same  
 “ time of rising and falling. To these ends of the arms rakes

" or boards are attached, which, as the axis rotates, lay the crop as required immediately in front of the cutters, and then as they are carried round by the axis they are caused to sweep along the platform upon which the crop falls and remove the crop in sheaves or bundles to the side of the machine." "The under sides of the arms which carry the rakes or boards are furnished with rollers, which rest upon a circular cam surface placed around the axis, which cam surface is so shaped as to give the necessary rise and fall to the boards or rakes." According to the Provisional Specification, "the invention also consists in making what are known as the finger plates of reaping and mowing machines of half-round or semicircular iron, or of tubular or ridge iron." No reference to this appears in the Final Specification.

[Printed, 1s. 4d. Drawings.]

A.D. 1861, June 1.—No. 1381.

GARROOD, CHARLES. — (*Provisional protection only*).—  
" Cultivators and horse hoes."

The following is the whole Provisional Specification :—

" This invention has for its object improvements in cultivators and horse hoes. For these purposes a cultivator has two or more axes, each carrying tines, and in order to fix the tines to the axes, each axis has a parallel bar fixed to and at a short distance from it; the stem or upper part of each tine is placed against the axis and its bar, and is retained thereto by a strap which receives the stem or upper part of the tine, and a key or wedge is driven in the strap on the other side of the axis and bar to that against which the tine is held. The axes are geared together in such manner that on one of the axes being moved round a distance by a suitable lever or instrument, the other axes and its tines are similarly acted on. This is accomplished by there being a cog wheel on each of the axes gearing into an intermediate wheel or otherwise, so that when the hinder axis is acted on by a lever or instrument so as to turn it in its bearings, the other or forward axis or axes will be similarly acted on.

" In arranging horse hoes, the rod on which the ends of the levers turn or move is adjusted in the following manner :—

" A connecting link or rod is applied to the rod at each end  
 " in connection with a screw and nut, by which the connecting  
 " rod or link can be raised or lowered, and the position of the  
 " cutters or hoes regulated as to their depth of working. The  
 " hinder bar carrying the guides in which the ends of the  
 " levers of the axes are received is capable of being acted on  
 " by suitable handles fixed thereto, so as to guide the hoes  
 " thereby, and by the same handles the cutters or hoes are  
 " raised out of the ground. The ends of the bar to which the  
 " forward ends of the levers carrying the cutters are connected  
 " are acted on by two drag links or rods in front. The for-  
 " ward ends of the levers of the cutters or hoes are connected  
 " to the rod before mentioned by a suitable universal joint,  
 " so as to admit of the separate hoes or cutters being moved  
 " sideways, and up or down independently of each other, and  
 " such universal joints may be made by springs, or by links,  
 " or otherwise."

[Printed, &c. No Drawings.]

A.D. 1861, June 3.—No. 1384.

HARWOOD, WILLIAM. — (*Provisional protection only*).—

" Reaping and mowing machines."

Improvements on the machines described in No. 2750, A.D. 1857, and No. 380, A.D. 1860.

The description of the invention is given in the following words:—

" My first improvement consists in the construction of a  
 " finger plate formed of one or more plates of metal made  
 " hollow or concave on its under side, by which means  
 " increased strength is obtained.

" My second improvement consists in the employment of  
 " riggers with ribbed or fluted surfaces for giving motion to  
 " the cutters, reels, delivering bands and other parts of reap-  
 " ing and mowing machines.

" My third improvement consists of an improved means of  
 " raising the finger bar and cutters off the ground. For this  
 " purpose I employ a ground wheel, the shaft or axle of  
 " which works vertically in sockets attached to the side of the  
 " machine on the top of a standard, the lower end of which  
 " has a bearing; on the wheel shaft there is a lever, from the



" short end of which a connecting rod descends, and is bolted  
 " to the frame of the machine, so that on depressing the larger  
 " or handle end of the lever the frame and cutters are lifted,  
 " thus enabling the driver instantaneously to raise the finger  
 " bar and cutters clear of stones or other dangerous obstructions.

" My fourth improvement consists in the application of an  
 " antifriction wheel behind the pinion to keep it in contact  
 " with the face wheel, which gives motion to the various parts  
 " of the apparatus.

" My fifth improvement consists in a mode of combining a  
 " cylindrical roller with the dividing pole heretofore used for  
 " preventing the accumulation of cut crop.

" My sixth improvement consists in the use of clamps with  
 " a screwed shank and tightening nut for adjusting and holding  
 " the reel arms.

" My last improvement consists in the use of a swinging  
 " bracket for supporting and guiding the motion of the connecting rod and knife bar."

[Printed, 4d. No Drawings.]

A. D. 1861, June 4.—No. 1402.

HANCOCK, JAMES LAMB, and HANCOCK, FREDERICK LAMB.  
 —" Implements for pulverizing, ploughing, and grabbing  
 " land," &c.

A set of longitudinal beams, connected by cross-bars at their ends, is mounted on a central pivot in a wheeled frame so as to be free to rock up and down. The beams are set at any required inclination by a screw at one end of the implement. Stems carrying shares are mounted on the beams, the effect being that when the beams are tilted the central set of shares are at a certain depth in the soil, the set at one end lower, the set at the other end higher. When the implement arrives at the end of a bout, the fore part of the beams is raised by the screw and the hind part consequently depressed. Mould boards may be hinged to the stems, so as to act in either direction. Mould boards may also be attached to the ends or sides of the implement to act on the soil previously ploughed. These are raised and lowered as required by levers. The shares are formed to act in either direction. Flat horizontal

shares with vertical stems may be used instead of the ordinary shares, these being set so that the cutting edges are at an angle of 45° to the line of motion of the implement.

The above implement is to be operated by steam power, but a similar implement may be drawn by horses. In this case only a single beam is used, and there are two furrow wheels, one at each end. These are fitted on jointed bars so that the one not in use can be turned up out of the way.

The rest of the Specification refers to an air engine for agricultural purposes, and to a method of regulating the speed of winding drums.

[Printed, 1s. 4d. Drawings.]

A.D. 1861, June 4.—No. 1409.

**WILLIAMS, JOHN ALLIN.**—"Implements for cultivating land  
"by steam power."

The implement consists of a combined arrangement of rollers or revolving harrows with fixed harrows. The frame is divided transversely into three compartments. In the central division several rollers, clod crushers, spiked rollers or other revolving implements are mounted on the same axis. In the front and hinder divisions drag frames are suspended by chains so that they can either be raised at one end, or entirely, suitable guides being fitted on the frame. These drag frames are fitted with straight tines. At each end of the frame an ordinary harrow is attached, a lever and connecting rod being arranged so that the harrow can be raised and held off the ground as required. At the side is a chain harrow, attached to a bar projecting out from the side of the implement. The frame is supported on a pair of wheels on the ends of the roller spindle, and these can be detached when required, so that the weight of the implement comes on the rollers. There are also small wheels in front and behind, and steering wheels at opposite corners, actuated simultaneously by an arrangement of levers. The implement is drawn by traction ropes from an engine, the line of draught being varied by causing the traction rope to bear against a pin which can be shifted to any one of a row of holes along the front cross bar. The return rope is laid out at the side, and in reversing the direction of motion at the end of each bout, the traction rope is kept against a pin at the side, until

the implement has been drawn on to fresh land, when it is slipped off, and is caught by the pin at about the central line of the implement. Spiked rollers with "webs" between the spikes may be "strung on to the axle side by side" instead of rollers. Instead of the chain harrow ordinary harrows may be fitted at the side. These are connected by a ring sliding on a bar fixed to the upper side of the harrow, so as to obviate the necessity of turning. In this case the end harrows are not used.

[Printed, 10*l*. Drawing.]

A.D. 1861, June 8.—No. 1461.

HOWARD, JAMES, and BOUSFIELD, EDWARD TENNEY.—  
"Hay-making machines."

1. Method of giving a reverse action to such machines. On the barrel is a pair of pinions capable of working into spur wheels on the bearing wheels. These are thrown in and out of gear by eccentrics on the same shaft operated by a hand lever. The same motion throws the pinions on the barrel in or out of gear with intermediate pinions always gearing with the teeth of the driving wheels. Motion is thus communicated in either direction to the barrel. Instead of these intermediate pinions pitch chains may be used which are tightened by the action of the eccentrics throwing the first-named pinions out of gear.

2. Eccentrics are used to raise and lower the tine barrels, these eccentrics being mounted on a cross shaft and actuated by a hand lever.

[Printed, 10*l*. Drawing.]

A.D. 1861, June 10.—No. 1483

ROMAINE, ROBERT —"Machinery applicable to steam cultivation."

Principally improvements on No. 1229, A.D. 1859, and No. 2003, A.D. 1860.

The first part of the invention relates to steam engines and winding apparatus. The three following parts refer to matters comprised in the present series.

1. A travelling anchor. The base plate of this is fitted with shares or teeth which sink into the ground. Over this plate

is a frame, and between the plate and frame is the pulley-sheave round which the rope runs. This is mounted on a vertical spindle carried by the frame and plate. The frame carries a crab and winch which winds up a rope attached to a fixed point to move the anchor. Brackets on the frame receive the axles of the bearing wheels, and these also serve as fulcrums for a set of crank levers to raise and lower the frame. The anchor when raised is held by a catch which is released after the anchor has been moved to the required position when it is allowed to fall, and its weight forces the holding blades into the ground. The frame is fitted with shafts to which steering wheels may be temporarily attached. A drum on which the traction rope can be coiled when not in use is mounted on the frame.

2. To prevent the necessity for mowing the plough sideways on to fresh land at each bout, the frame carrying the ploughs is mounted at the side of the central shaft of the implement, and by means of a semicircular rack and pinion or other suitable gear, the plough frame is turned over on to the fresh land. After every other alternate the implement has to be steered sideways as usual.

3. Cultivators are mounted in a frame swivelling on a vertical spindle in a supporting frame. Both ends of the traction rope are attached to the same point of the swivel frame, so that the pull of the return rope revolves the implement into the proper position for the return bout. The inner frame is supported on rollers on the other frame, and is held in position thereon by spring catches. Suitable apparatus is arranged for raising and lowering the tines, and the implement is steered by wheels suitably actuated.

[Printed, 3s. Drawings.]

A.D. 1861, June 12. No. 1502.

GEDGE, WILLIAM EDWARD, — (*A communication from Victor Emile Donat Duchateau*) — "Reaping and mowing machine."

The driving part of the apparatus is supported on two bearing wheels, one of which runs loose on its axle, the other being the driving wheel. There is a clutch for throwing the apparatus out of gear. The draught pole may be moved and set to one or other side as required. For transport, the platform can be turned up. There is an adjustable reel.

The divider is formed of "three branches, the middle one "being slightly elevated above the others" The "saw" is "composed of two (or three) blades superposed and attached "by rivets." "The narrowest is of one piece throughout its "length; the upper blade on the contrary is composed, as "those of ordinary saws, of a series of fragments, which "can be easily replaced when worn out. This upper blade, "which really forms the active part of the saw, presents in its "entire length a series of curves in form of sickle, the points "of which are about three and a quarter inches apart, and "the entire development of which is toothed with a graver." Between the fingers are points, which form a "saw guard." The "saw" is worked by a bent lever operated by a crank. The cut crop is received by an endless cloth which carries it back and delivers it to a set of endless bands which deposit it at the side. A "metal apron" is hinged to the back of the platform to retain long ears, and under the platform is a slide to receive any grain that may fall through. The platform is supported on two castor wheels behind and one in front.

[Printed, 8d. Drawing.]

A.D. 1861, June 13.—No. 1526.

**BAYLISS, WILLIAM.**—"Chain harrows."

Strips of thin steel or other material of sufficient pliancy are used as "stretchers." These are fixed transversely across the harrow by having their ends forked and the fork fitted through one of the outer links, and by passing them through a certain number of intermediate links which are made of such suitable form as to enable the strips to be passed therein. The last row of links are preferably "of a triangular shape, "the base line of which is horizontal to the ground over which "they pass, or they may be made of any other like shape "calculated to produce the desired object, which is to further "smooth or level the land."

[Printed, 6d. Drawing.]

A.D. 1861, June 14 —No. 1532.

**WEDLAKE, THOMAS WILLIAM.**—"Hay-making machine."

1. The tire cylinder is caused to revolve in either direction as required. This is effected by bevelled gearing and a sliding

clutch so that a transverse shaft driving the tine cylinder can be driven in either direction by a bevel wheel on the axle of the bearing wheel gearing with either two bevel wheels on the transverse shaft.

2 A method of raising and lowering the tine cylinder. The box carrying the axle of the tine cylinder is connected to the shafts by two arms, one curved and fixed to the bottom of the box, the other straight and fixed to the top thereof. By means of a rack and pinion at the ends where these are joined to the shafts, the relative position of these arms can be altered and the box thereby rotated on the axle of the bearing wheels as a centre. This causes the tine cylinder to be either raised or lowered.

[Printed, &c. Drawings.]

A.D. 1861, June 14.—No. 1533.

LEACH, GEORGE —“ Implements for tilling and cultivating the soil,” &c.

The invention refers to a cultivator and also to a steam engine for operating the same. With regard to the first portion of the invention the inventor says:—“ My invention consists first in mounting upon a shaft and at an incline a plane or toothed disc, the teeth being formed in a piece with a disc or made separate therefrom and fixed thereto. Rotary motion is communicated to the shaft and consequently to the discs which cut or break up the soil, pulverize it and turn it over. I denominate my improved implement the ‘ steam mole.’ Similar effects may be produced by mounting toothed discs at right angles upon a shaft, and while the same are rotating upon the shaft lateral oscillating motion is given to the shaft and discs equal to the distance the discs are set asunder, by which means a breadth of land may be cut up or cultivated equal to the distance between the extremity of the traverse of the two endmost discs upon the shaft. By having a drum, and mounting or bolting upon the periphery thereof single teeth, or segments of more than one, two or any number of teeth, such teeth may be made of any desired shape or form best adapted to the soil to be operated upon.” The drawings show an apparatus of this description, attached to the back of a locomotive engine. The discs are set square



across the shaft, or at an angle thereto, and the shaft may have a to-and-fro longitudinal motion given it by crams or otherwise. If the discs are set at an angle to the shaft, they are "slightly elliptical, so that their peripheries may in revolving describe a perfect circle."

[Printed, 1s. 4d. Drawings.]

A.D. 1861, June 25.—No. 1628.

FOWLER, JOHN, junior.—"Machines for ploughing or tilling land by steam power."

The invention relates to an anchor carriage. This carriage is mounted on four disc wheels, three in a line at the back, and one in front, the single one being in front of the sheave, so that the rope passes on either side of it. The two outer of the three hinder wheels are mounted so that they can be turned simultaneously by a shaft with worms thereon. They are turned in opposite directions, so as to cause the carriage to travel in a circle. The carriage is moved by a small winding drum mounted thereon which is locked with the sheave for the traction rope and rotated thereby. This arrangement is not considered as forming part of the present invention.

[Printed, 10d. Drawings.]

A.D. 1861, June 29.—No. 1665.

CLARK, WILLIAM.—(A communication from Francis Harper, Scot., James Beagley and John Benoit, Patrs.)—"Excavating machinery."

The object of the invention is "to adapt excavating machinery to deep tile draining." A steam engine is caused to travel along a rack, temporarily laid down on the ground, by means of cog wheels engaging with the rack. A frame is fitted to the engine so that it may rock up and down on a pivot by which it is pivotted to the engine frame. This rocking frame carries a spade wheel, driven by band or spur gearing acting at a point near its upper edge, so that the spade wheel may be lowered into a trench deeper than its axle. The wheel is supported by a shield at each side. The driving gear is suitably arranged to allow of the up-and-down movement of the frame carrying the wheel. To clear the spades, an engine

less band carrying scrapers travels on vertical pulleys, and is arranged that the scrapers pass across the spaces between the spades. These scrapers are carried against a fixed scraper to clear them. Two fixed inclined blades are mounted in front of the wheel to throw loose earth to the sides. To cut a trench wider at top than below, the wheel may be set diagonally.

Instead of having the spade wheel mounted behind the engine, it may be mounted in a frame projecting from the side. The other arrangements are the same, except that a single reciprocating spade is used as a clearer instead of the endless band with scrapers. This spade throws the earth off sideways down a trough.

The track may be laid down so as to keep the bottom of the trench at any level required, without reference to inequalities in the ground.

When the trench is too deep for its bottom to be reached by hand, the tiles are to be laid "with tongs or with a bent "rod"

[Printed, 1s. 2d. Drawings.]

A.D. 1861, June 29.—No. 1667.

BRAGG, ISAAC.—"Reaping and mowing machines"

The fingers are made in two parts, connected by screws, one half being above and one below. Between the two parts is a space in which the knife works, the knife coming right up to the point of the finger. The knife bar is bevelled, and the knives are attached alternately on each side. The object of this is to prevent clogging.

[Printed, 6d. Drawings.]

A.D. 1861, July 9.—No. 1735

PRIEST, ALFRED, and WOODNOUGH, WILLIAM, the younger.  
—"Machinery for drilling and hoeing land."

1. In front of the "steering posts" is a transverse bar with screw sheaves thereon. Chains are wound on these sheaves, and are attached to the front frame. As the bar is revolved by means of a crank handle, the chain is wound off one sheave on to the other, and the frame thus moved from side to side to

steer the implement. The crank may work through multiplying wheels.

2. A "turntable" is fitted so that it may be placed under the wheel in turning at the headlands, &c. This is effected by a lever, on which the "turntable" is carried.

3. The "swing or pendant irons," which carry the bar supporting the ends of the hoe levers, are suspended "from a rocking shaft with double cranks or levers, so placed that when one lever is depressed the other is raised, and vice versa, the pendant irons and horizontal bars being retained in the position required by ratchet wheels and pallets." The hoe levers and guard bar "are attached to cranks or eccentrics fixed to the side frame by chains, and thence connected to the handle by which the man steers." By this means "when the steering handle is depressed, the hoes are taken out of work."

4. The coulter blade is separate from the stem, so that as the blade gets worn it can be replaced. The "shoe or wearing part" is made with tenons fitting in corresponding mortices in the stem and is secured by a peg.

5. For distributing artificial manure, the box for holding the same is mounted so that "the front part of the box nearest the bottom" is caused "to oscillate by means of eccentrics or cranks driven by gear wheels or other suitable machinery so that at each motion of this vibrating door a regular quantity of manure is continually supplied to the board that delivers it into the spouts or distributing hod."

[Printed, 10d. Drawing.]

A.D. 1861, July 11.—No. 1752.

REEVES, THOMAS, junior.—"Apparatus for applying salt or other material to the roots of weeds." A cutter of suitable form is mounted on the end of a stem. Immediately over the blade is a hopper with a valve at the bottom. This valve is opened by a lever, which, when the blade is driven into the ground, strikes against the ground and thereby operates to open the valve. Salt or other material is placed in the hopper, and by the action of the implement it is discharged on to the root as the root is cut by the blade.

[Printed, 10d. Drawing.]

A.D. 1861, July 13.—No. 1767

SMITH, THOMAS, and TAYLOR, GEORGE.—“Horse rakes and  
“cultivators.”

1. The tines are mounted so that a certain number in the centre are allowed to descend below the rest, in order to work in a furrow if required. This is effected by cranking the shaft on which they are carried, the central cranked portion being held by a “moveable cradle” held in any required position by a stay. Or the tines may be mounted separately and independently.

2. In wheels for horse rakes, cultivators and carriages generally, the spokes are formed of iron tubes “filled at their ends with wood, iron, or other material, and around such ends an iron ring is fixed by spikes or bolts driven through the ring into the interior of the spokes.” A suitable tyre is shrunk on over all. The spokes may be hollow at the end only, instead of being tubular throughout.

3. To raise and lower the tines of cultivators, a lever is used, pivotted to the front of the frame, and held at the height required by a quadrant at the back. “To the fore end of the lever which projects beyond the axis or fulcrum there is applied a link or connecting rod, which at one end is jointed to the fore end of the lever” and at the other “to an arm on the front axis or frame to which the front tines are fixed, and as the front and hind axes or frames” “are connected by connecting rods” both set of tines will be acted upon simultaneously

[Printed, 10d. Drawing.]

A.D. 1861, July 24.—No. 1837.

C'RANSTON, WILLIAM Mc INTYRE —(*A communication from William Anson Wood and John Milton Rosebrooks.*)—“Grass-mowing machines.”

“This invention consists in the use of two frames, one hinged to the other, and each carrying a part of the gearing, but so that whilst one frame may move or play upon the other, the gearing on each will continue in mesh.” The two frames are hinged together at the back. The upper one carries the bearing wheels and the shafts, the under one the cutter frame, &c. Part of the driving gear is on one

frame and part on the other. There is a bevel wheel, driven by the running wheels, on the bar forming the hinge joint, and a bevel pinion gears into this and drives the cutters through the usual mechanism. This pinion remains in gear whatever may be the relative position of the frames. The driver's seat is on the upper frame, and a lever on the lower frame is placed within the driver's reach so that he can raise and lower the second frame with the cutters, &c. A catch is fitted to hold the lower frame off the ground when required.

[Printed, 6d. Drawing.]

A D. 1861, July 30—No. 1898

ASH, WILLIAM HENRY. — (*A communication from Nicholas Cornes*). "Reaping and mowing machines."

The cutter is driven by a "serpentine cam groove" on the driving wheel. A small roller running in this groove is fitted on the end of a rod connected direct to the cutter bar. The roller can be lifted out of the groove by a lever, to throw the apparatus out of gear. The platform is hinged so that it can be turned up out of the way, and there is a second bearing wheel, not used for driving. The fingers are hollow underneath, being slotted through on their under sides. The knives are triangular and sickled. They are separate so as to be capable of being removed. A bar is fitted in front of the driving wheel to prevent clogging. The vanes of the reel, according to the Provisional Specification, are set diagonally to the line of the cutters, but this does not appear to be referred to in the Final.

[Printed, 1s. Drawings.]

A D. 1861, August 13.—No. 2007

HUMPAGE, JOSEPH. — (*Provisional protection only*). "Reaping and mowing machine."

The cutter is driven by a lever operated by a cam groove in a wheel on the axle of the bearing wheels. The platform is moveable. To gather the cut crop, "two vertical gathering forks approach one on either side," and grasp the corn, &c. which they carry and deposit in a sheaf at the side. The "travelling motion of the forks is effected by a crank" on the axle of the bearing wheels; "this crank is connected by

" a link with a lever on a vertical axis," which supports a  
 " horizontal arm on which the two forks are supported "  
 The crank " gives an alternating motion through a quadrant  
 " to the arm carrying the said forks " The opening and  
 closing of the forks is effected by a cam on the axle of the  
 bearing wheels. The cam acts on levers to open the forks and  
 they are closed by a spring. The implement is pushed from  
 behind by the horse.

[Printed, 4d. No Drawings.]

A.D. 1861, August 19.—No. 2060.

FIRTH, WILLIAM. — (*Letters Patent void for want of Final Specification*) — " Machinery for digging or turning up soil, mowing, reaping, and other agricultural purposes "

The following is the whole Provisional Specification —

" My invention consists in an arrangement of a series of  
 " picks for digging, or knives or cutters for mowing or  
 " reaping, worked by springs. The springs are regulated by  
 " wheels, or cylinders and tappets, or other suitable me-  
 " chanical contrivances, so that, being coiled or drawn up by  
 " the wheels or cylinders, they are liberated by the tappets  
 " so as to act upon the digger, and thus produce one stroke  
 " of it, or more than one stroke, at each action of the spring  
 " knife or cutter, which is repeated in the same manner so as  
 " to produce a successive series of strokes. The number of  
 " the diggers may be increased or diminished to any extent  
 " which may be found convenient in practice, and the ma-  
 " chinery may be driven by either steam, horse, or any other  
 " motive power. Moreover, the arrangement of the machinery  
 " may be easily adapted to give the digger, cutter, or knife  
 " either a sweeping or curvilinear stroke, or a straight or  
 " direct stroke, as may be required."

[Printed, 4d. No Drawings.]

A.D. 1861, August 20.—No. 2078.

FISHER, NICHOLAS. — " Implements for grubbing and culti-  
 " vating land."

The blade or cutting part of the tine is separate from the  
 stem and in two parts. The stem is of wrought iron (the  
 Provisional Specification says " wood.") Over the lower part



of the stem fits a curved iron of suitable form tapering to a point. This part is preferably of cast iron. Under this, and forming the bottom of the tine, is a "sledge or sole very similar to a Kentish plough." This sole may be of different shapes, according to the class of land to be treated. Several shapes are figured in the drawings. Both the lower portions of the tine are connected to each and to the stem by screws.

[Printed, 1s. 2d. Drawings.]

A.D. 1861, August 21.—No. 2081.

LAMBERT, THOMAS. (*Provisional protection only*).—"Agricultural implement for rolling ridges and furrows or straight work."

The following is the whole Provisional Specification.—

"This invention consists in mounting two or more metal rollers loosely side by side upon a rod, and at suitable distances asunder, said rod and rollers being held in a framing, to which shafts or other appliances are connected, for enabling the rollers to be drawn by horses. The rollers employed for rolling ridges and furrows are suitably formed for that purpose, whilst the other or intermediate rollers, which keep the aforesaid ridge and furrow rollers at the proper distance asunder, are formed cylindrical and of considerably smaller diameter, so that for straight work by removing the ridge and furrow rollers and connecting the cylindrical rollers together, a plain roller may thus be produced adapted for straight work."

[Printed, 4d. No Drawings.]

A.D. 1861, August 22—No. 2097

SAMUELSON, BERNHARD. — (*Partly a communication from Owen Dursey.*)—"Harvesting machines."

1. In machines with a fixed platform, or without any platform, a series of arms mounted on a vertical rotating shaft carry rakes which serve to carry the uncut crop to the cutters, and then to sweep the cut crop across the platform (when one is used) on to the ground. For this purpose guides are fitted to direct the path of the arms, which are capable of rising and falling within suitable limits. The path of all the arms need not be the same, projections being fitted so that they travel at

different heights over the guides. By preference the rakes are "so shaped that one or both of the ends thereof shall approach the cutters in advance of the centres." The platform is quadrant shaped, and has a guard round it.

2 When the corn, &c. is delivered by endless travelling belts, a seat or stand is fitted "in advance and on one side of the cutters," on which an attendant may stand to rake the uncut crop to the cutters.

[Printed, &c. No Drawings.]

A.D. 1861, August 23.—No. 2106.

DUNN, JOSEPH.—(*Provisional protection only.*)—"Reaping machines."

The following is the whole Provisional Specification:—

"My improvement or improvements in reaping machines consist in actuating the knives or cutters in the following manner: From a bracket fixed on the side frame of the carriage is suspended a bent oscillating lever, the lower end of which is connected with the cutters; the said lever carries two pulleys placed at equal distances, one above and one below the centre pin on which the lever moves and is suspended. To the spokes of the carriage wheel on its inner side is fixed a circular rack, into which the said pulleys gear. As the wheel revolves, these traverse the teeth or projections on the said rack, and thus communicate to the said lever and the said teeth a reciprocating motion. By means of an ordinary slide lever the said pulleys may be put out of gear when the knives are not required to be in use."

[Printed, &c. No Drawings.]

A.D. 1861, August 30—No. 2155.

OWEN, LEMUEL DOW.—(*A communication from Martin Buck.*)—"*Provisional protection only.*"—"Ploughs"

The following is the whole Provisional Specification:—

"This invention relates to certain improvements in the form of the mould board, also the arrangement of the coulter in connection with the plough point. I make the working surface of the mould board in the form of a section of the interior surface of a hollow cylinder, the centre or axis of

" said cylinder being parallel, or nearly so, horizontally to  
 " the base of the mould board or bottom of the plough. I  
 " make the plough point with a coulter or cutter rising from  
 " it nearly perpendicular, of sufficient height to cut or divide  
 " the soil that is to be turned from the land side."

[Printed, 4d. No Drawings.]

A.D. 1861, August 31.—No. 2169.

HENSMAN, WILLIAM, and HENSMAN, WILLIAM, the  
 younger. — (*Letters Patent void for want of Final Specification*.)  
 " Apparatus for tilling land by steam power."

1. A winding drum is described  
 2. " The improvements in cultivators consist of a frame or  
 " carriage mounted on travelling or furrow wheels and fur-  
 " nished with steering or guiding apparatus, which frame  
 " carries two or more beams for the attachment of plough  
 " shares, tines, or other cultivators, in such manner as to be  
 " adjustable to any required width or depth of furrow. The  
 " ploughs and beams may be so arranged as to be easily  
 " reversed at the end of each furrow by means of an universal  
 " joint, or they may be jointed to a central cross bar of the  
 " frame and their hinder ends supported by a balance lever.  
 " The ploughs may be of any of the ordinary kinds, but we  
 " prefer to use an improved form of plough with an adjustable  
 " coulter, turn over share and sliding shield to lay the furrow  
 " slices all one way. The tines are two-edged, either with or  
 " without cross blades, and have a dovetailed hole in the  
 " centre through which the stem is passed and secured by a  
 " cross pin; the tines are held to the frame by adjustable  
 " clamps which permit them to have any required inclination.  
 " These cultivators are drawn by ropes winding upon the  
 " windlass, actuated by a steam engine in the usual manner."

[Printed, 4d. No Drawings.]

A.D. 1861, September 12.—No. 2264.

STEEVENS, WILLIAM. — " Apparatus for ploughing and culti-  
 " vating the land by steam and other power."

A long frame mounted on a pair of wheels at the centre and  
 a steering pair at each end has connected thereto two trams,  
 one at each end. These are swung below the main frame, so

that they can be raised and lowered by an arrangement of levers. They are connected together, so that as one rises the other falls. To these frames the ploughs or other cultivating implements are attached, the two set looking in opposite directions, and coming into action alternately according to the "direction in which the apparatus is moving." The implements named include "ploughs, land rollers, harrows, cultivators, or broad shears." "Meadow or grass lands" may be cultivated "by cutting a deep seam and lifting the top without turning over the grass turf so as to ventilate and allow the water and air to percolate through the earth without damaging the upper surface." The implement used for this purpose "has a projection at each side and a cutting part at the bottom that forms the drain and lifts the land as they pass through." For ploughing heavy lands a cistern is fitted "to supply water or liquid manure on to the mould boards."

According to the Provisional Specification, "the rope porters are so formed that the steel rope can pass over them without being lifted, there being a guide iron from the front and a handle fixed to pull them back and forward fixed on a wood frame." No reference to this appears to be made in the Final Specification.

[Printed, 8d. Drawing.]

A.D. 1861, September 17. No. 2314.

SAMUELSON, BENNHARD.—"Harvesting machines."

At the side of the cutters, and about in a line with them, is a shaft rotated by suitable gearing from the driving apparatus. This carries six or more arms with vanes or rakes thereon. These work over guides so that every alternate arm brings the uncut crop to the cutters, the other arms passing over the platform and clearing it. The rakes may be turned into "toothless sweepers" by bolting on "boards or masks" which cover the teeth partly or entirely.

[Printed, 10d. Drawing.]

A.D. 1861, September 17. No. 2318.

D'OLINCOURT, FREDERICK JAMES EUGENE ALEXANDER GIGAUT. (*Provisional protection only*)—"System of cultivating land."

The "system" appears to consist in forming dykes or banks round fields, to retain the rain-water therein. When the land is sufficiently irrigated a hole is pierced in the bank and the water allowed to flow off. It also appears that the land is to be laid out in terraces. This is to be effected "by commencing the first furrow at the lower part of the earth, and forming the other furrows successively in a parallel direction, and juxtaposed so as to effect by successive tillings the elevating of the upper part of the field to bring it back to all up the lower part until all the superficies of the soil become perfectly horizontal."

[Printed, *ad.* No Drawings.]

A.D. 1861, September 18 — No. 2327.

WICKENS, HENRY. — (*A communication from Nicholas Crompton* — *Provisional protection only.*) — "Reaping and mowing machines"

The machine may be constructed for reaping only, or for reaping and mowing. The cutter is driven by a roller working in a cam groove in the driving wheel periphery. In the reaping machine "a roller suspender acts as a pendulum or beam" it is hung from journals." In the combined machine, instead of the "pendulum or beam motion there is a lever bar, the fulcrum of which works on a pin." This pin being fitted through holes at different points in the lever, the length of its throw is varied. The roller is raised out the groove to throw the apparatus out of gear. The combined machine has also a "separate set of knives, guards, and finger bar or sill;" it can be "worked with a shoe instead of a wheel" at the end of the finger bar, and without the reel. "The knife bar to which knife guards are attached is connected to the iron frame by an iron knee plate." It can be raised and lowered "by means of an upright bolt."

[Printed, *ad.* No Drawings.]

A.D. 1861, September 20 — No. 2354

PERMAN, CHARLES. — "Apparatus for cutting and turning up the soil"

Several tire cylinders are mounted on an axle in a frame supported by running wheels the bearings of which can be raised and lowered to lift the tires clear of the ground for

transport. The number of cylinders may be varied, to regulate the width of the implement. Knives may be fitted on the cylinders between the tines in a plane at right angles to the axis. Suitable scrapers are affixed behind the cylinders. The tines are moveable so that a greater or less number may be used as required. A drill may be attached behind the frame, and a harrow behind this again. The implement may be drawn by horses, steam or other power.

[Printed, &c. Drawing.]

A D. 1861, September 27. — No. 2418

ROWSELL, SAMUEL.—Horse rakes.

"These improvements consist in forming the beam or head of the rake of tubular iron, through which the teeth are fastened," "and in so arranging the bearing pieces that they take a bearing on the ground behind their centres by which means less weight is thrown upon the hands of the user."

The invention is figured and described further as applied to a "revolving (or American) horse-rake." In this there are two sets of tines fixed in the same line across a head of tubular iron. This head is free to turn in the draught frame and has on it "bearing pieces" of an elliptical form with projections behind their centres on which they rest. The handles are beside these bearing pieces, and rest in notches therein so that the rake can be allowed to revolve or be held firm. The draught chains may be attached to the front of the frame, or to loops on the handles, so that these can be allowed to turn over, and set the horse free suddenly if required.

[Printed, &c. Drawings.]

A.D. 1861, October 2.—No. 2452.

RÉROLLE, DENIS.—(*Provisional protection only.*)—"Steam digging machine"

The machine is applicable to the cultivation of land, for cutting drains, &c. "The apparatus for digging consists of a wheel with teeth, which turning from below upwards, raises the earth and throws it off in such a way as to allow the passage of the machine. This wheel is put in motion by another wheel with rollers which catches directly with its



"teeth; it is usually furnished with scrapers." The earth may be conveyed away by an endless travelling band, and this if long may be supported by "a line of small cars" each with a "small travelling belt driven from the engine."

[Printed, *ad.* No Drawings.]

A.D. 1861, October 5. — No. 2487.

LANSLEY, JOHN.—"Ploughs, drills, scarifiers, and such like agricultural implements."

The improvements relate to a method of steering agricultural implements. In ploughs and other implements to which the method is applicable, the end of the beam carrying the fore-carriage is hinged to the other portion and is held rigid by a catch, which is raised by a wire when the plough is about to be turned. "The head of the plough is formed so as to terminate in an eye, upon this upright bearers, which rest upon the axes of the wheels, there slides a small square draft frame, so as to move upwards and downwards; centrically in this frame is placed the eye head of the beam, the regulating screw then passes through both the draft frame and the head of the collar above both, hence by adjusting the screw the beam and the draft frame are at the same time raised or lowered."

In implements with a single steering wheel, drills, &c., the stem of this wheel is pivotted to the end of the main beam of the implement, and the usual transverse horizontal steering lever affixed thereto.

[Printed, *ad.* Drawing.]

A.D. 1861, October 16. — No. 2576.

NEWTON, ALFRED VINCENT — (*A communication from Edwin Percy Russell and Porter Tremain.*)—"Grain and grass harvesters."

"The main framing is mounted on a pair of wheels, the outer one of which is the driving wheel, and is set somewhat in rear of the inner wheel. From the inner side of the driving wheel project pins set equidistant from each other and carrying anti-friction rollers." These rollers "work into a screw mounted on an inclined shaft, and impart through a

" clutch rotary motion to the shaft." " A disc at the lower  
" end of this shaft carries a crank pin, which enters a coupling  
" box connected by a ball and socket joint to the driving rod  
" of the sickle bar, which is itself so connected to the sickle  
" bar as to allow of its self-adjustment vertically to suit the  
" irregularity of the ground." " The finger bar is attached  
" to the main frame by means of a shoe provided with two  
" eyes, through which an oblique or diagonal rod passes from  
" the back to the front of the machine." " At its forward end  
" this rod is connected by a joint or pin to the front left hand  
" corner of the frame, while the back end is fitted in a bar,  
" the outer end of which is attached by a joint or pin to the  
" back part of the frame. The back eye of the shoe is made  
" oblong to admit of a certain degree of vertical play of the  
" back part of the shoe and finger bar, and also of the plat-  
" form when that is used " To keep the balance of the machine  
" when the finger bar is raised from the ground for purposes of  
" transport, the driver's seat " is supported on bars, the lower  
" ends of which are secured in sockets on the main frame."  
" This arrangement admits of the seat being adjusted in two  
" different positions, the seat having a backward position  
" when the bars rest against the back parts of the sockets,  
" and a forward position when the bars rest against the front  
" parts of the sockets. The pulley which drives the reel shaft  
" is keyed to a hollow journal or shaft having a squared hole  
" to receive the squared end of the reel shaft, which is slidden  
" therein. This hollow shaft is supported in a bearing  
" spherical on its under side and provided with a pendent  
" pin. A bracket piece attached to the main framing, and  
" provided with two legs, supports this bearing, the pin of the  
" bearing going through the legs and being free to move  
" laterally therein. The other end of the reel shaft is carried  
" by a bar attached to the outer or grain end of the platform."  
" This " prevents the reel shaft from interfering with the play  
" of the platform and sickle bar to suit the inequalities of the  
" ground " The arms of the reel are attached to the shaft by  
" clamps " formed each of two parts and provided with radial  
" grooves, which parts are bolted together and secured to the  
" shaft by clamping screws."

[Printed, 10d. Drawing.]

A.D. 1861, October 19.—No. 2617.

CAMBRIDGE, WILLIAM COLBORNE. Harrows.

The improvements are applicable to the class of harrows described in No 2606, A.D. 1860, and also to harrows generally. Instead of using binding rods which pass from side to side of the harrow and tubular pieces thereon to keep the longitudinal beams at proper distances apart, the cross-bars are formed of several pieces, one piece between every two adjacent tines. These pieces have alternately male and female screws, and have also collars formed thereon. When they are screwed together, they are caused to clip the tine heads and bars between the collars. The outside rows of tines are secured by nuts.

[Printed, 6d. Drawing.]

A.D. 1861, October 21 —No. 2630.

MAILLARD, NICHOLAS DORAN PROBY. —(*Provisional protection only*).—"Ploughs."

The following is the whole Provisional Specification:—

"My invention of improvements in ploughs relates to a novel mode of constructing that part of the plough which turns over the earth after it has been cut away or separated from the land. By my invention a considerable portion of the ordinary turn furrow or breast of the plough is dispensed with, and in place thereof a series of vertical rollers or cylinders are employed to turn over the earth. The object of my improvements is to reduce the friction of the earth against the several parts of the plough as much as possible, and therefore in carrying out my invention I not only use vertical rollers or cylinders as a means of turning over the earth instead of the ordinary breast, but I also introduce horizontal rollers in the sole plate, and another set of vertical rollers at the back of the plough, for the purpose of maintaining the plough in a vertical position. The vertical breast rollers are mounted in a frame or arms which turn on a centre pin near the fore part of the plough, so that by pushing the vertical roller frame outwards and setting it at any given position, the furrow may be wider or narrower, as may be required or considered desirable."

[Printed, 4d. No Drawings.]

A.D. 1861, October 22.—No. 2641.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Cyrus Hall McCormick.*)—(*Provisional protection only.*)—"Improvements in reaping machines."

The following is the whole Provisional Specification:—

"The object of the present invention is to obtain the delivery of the cut crop from the side of the platform of the machine.

"The invention consists in the employment of a rake head to take the place of one of the ribs or vanes of the reel in gathering the grain or crop to the platform, which rake head is made to act as hereafter explained. The teeth of the rake project beyond the other ribs, and come close to the platform. When the rake head reaches over the platform at the cutting blades it leaves the circle of the reel, and passes over the surface of the platform in a horizontal direction, or nearly so, and pushes or pitches the cut corn or other crop from off the side of the platform, the rake then rises and regains its position as a rib or vane of the reel. The rake is connected with machinery, which works it by means of an arm. The machinery consists of an eccentric with a pulley fastened to the reel post in connection with a crank and lever attached to the reel shaft, the end of which passes through the vertical eccentric."

(Printed, &c. No Drawings.)

A.D. 1861, October 23.—No. 2647

WILSON, JOHN WILLIAM.—(*Provisional protection only.*)

"Improvements in machinery for digging and cultivating the soil and in steam engines."

The following is all the portion of the Provisional Specification referring to the present series:—

"My improvements in machinery for digging and cultivating the soil consist of a revolving shaft furnished with an eccentric connected by links to crank shafts, to which are attached spades and picks in such a manner that the spades and picks enter and are drawn out of the soil at any angle to its surface, whereby the operations of loosening and turning the soil are effected with less power and more effectually than heretofore. The picks and spades may be used combined or

"separately, and they are so arranged that when used in combination the picks enter the soil in advance of the spades, and the width of the spades and the depth they enter the soil can be regulated so as to bring the subsoil to the surface, or only to loosen and agitate the soil. When the machinery is not in operation the eccentric is moved into such a position that the picks and spades are raised above the level of the soil."

The rest of the Provisional Specification refers to agricultural steam engines.

[Printed, 4d. No Drawings.]

A.D. 1861, November 8.—No 2802.

DARBY, THOMAS CUTCHMAN.—"Construction of horse hoes"

The axle is composed of several bars fitted side by side and overlapping. By removing a pair of these bars, or substituting longer or shorter bars, the length of the axle can be varied. The draught chains are connected to the ends of the axle, and on the centre of it is fixed a block with an upright stem on which a beam is fitted to slide. This beam is double, and projects backwards, each part being free to move separately. To the hinder end of each part is affixed a cross beam, the other end of which is supported by a stay from the front of the longitudinal beam. Each cross beam carries hoes, suitably fitted thereto, and there are thus two similar frames side by side and connected to the axle in front. These two frames are connected near their rear ends by a hinge joint, which allows them to take different angles to each other. If preferred there may be three or more such frames. Handles are affixed in the usual manner. The "outermost hoe" may be forced down lower than the others by a spring. Stump ploughs may be substituted for the hoes. For purposes of transport, the frames are detached and mounted on the axle.

[Printed, 10d. Drawing.]

A.D. 1861, November 16.—No 2884.

GIBSON, MATTHEW.—"Reaping and mowing machines"

The knife bar is formed with projections on its under side which work in grooves across the necks of the fingers. The groove is formed with a ridge along its bottom so that the

projections of the knife bar rest on the edge of this ridge. The projections are formed on the bar or the knives, according as the knives are fixed on the upper or under side of the bar. The back of the knife bar also has projections on it which work against projections on the edge of the finger bar. The object of these arrangements is to prevent clogging.

[Printed, 6d. Drawing.]

A.D. 1861, November 18. —No. 2896.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Cyrus Hull McCormick.*)—Reaping machines.

The invention consists in a method of fitting the rake so that it revolves with the gathering reel and acts as part thereof during part of the revolution of the reel, and during the other part it is caused to sweep across the platform and discharge the cut crop therefrom. The mechanism by which this is effected requires a drawing to make it properly intelligible. The rake is hinged to a short hollow shaft on the reel spindle, and this is connected to the reel spindle by jointed links. At the joint of the links is a roller running in a cam groove on a fixed disc. The shape of the groove is such as to alter the relative position of the links and consequently the movements of the hollow shaft carrying the rake and the reel spindle, the rotation of the latter being stopped at certain points. An arm on the reel spindle then comes against the arm of the rake and causes it to swing on its hinge and thereby to pass across and clear the platform.

[Printed, 10d. Drawing.]

A.D. 1861, November 23.—No. 2948.

BRAY, WILLIAM. — "Locomotive apparatus particularly adapted to agricultural purposes."

Various improvements in agricultural engines are described. The only portion of the invention relating to matters connected with this series is as follows:—"Connected to each end of the engine, for agricultural purposes, is a frame (firmly bolted or hinged to an under locking frame of the engine); this frame is supported at each end by a small pivot wheel or by a supporting wheel which will run in the last furrow or on the unploughed land. The frame may be oblong or



triangular. It is "slotted at each end, in which slots several "moveable beams are placed longitudinally, in order to carry "any implements for tilling," &c. These are fixed as required by screws, &c., and raised or lowered by a rack and pinion, &c. either together or separately, one set being in use, while the other set are raised from the ground. The frame may also be jointed, and raised by a chain and pulley. Above the frame is a platform for the attendant. In the drawing only one such frame is shown, attached behind an engine, and it appears to be fitted with only a single set of cultivating tools.

[Printed 8d. Drawing.]

A.D. 1861, November 25. —No. 2957.

BURGESS, WILLIAM.—"Reaping and mowing machines.

1. A method of decreasing the width of the machine, to enable it to pass through gates, &c. Bars are fitted to the frame carrying the gearing, and on these bars are slides to which the reel standard and a shoe carrying the end of the cutter bar, &c. are fitted. The end of the cutter bar is hinged to the shoe to allow it to rise and fall with irregularities in the ground. In use these slides are held firm by pins. When it is required to make the machine narrower, the connecting rods driving the cutter and delivery apparatus are detached, and one part of the machine is slid over the other.

2. Motion is given to the reel by bevel gearing, one of the bevel wheels being free to slide on its vertical shaft, so as to keep in gear with the wheel on the horizontal shaft which is shifted up and down to regulate the height of the reel. This horizontal shaft has a universal joint thereon and also a sliding joint, to enable the reel to move up and down into the cutters. The delivery apparatus (which is figured in the drawing as consisting of an archimedean screw) is driven in a similar way by a jointed and hinged shaft.

3. The height of the knife is adjusted by means of a castor wheel at the back of the machine. This wheel may be prevented from swivelling round by a catch dropping into a slotted quadrant on its stem.

Besides the above, the following are referred to in the Provisional Specification but not in the Final.

4. A finger "similar to that known as McCormick's" is used, with a guard.

5. Rakes are fitted to the reel so as to act as part of the reel and also to clear the platform.

[Printed, 10x7. Drawing.]

A.D. 1861, November 27. --No. 2989.

NEWTON, ALFRED VINCENT. (*A communication from William Van Anden*)—"Mowing and reaping machinery."

"The frame which has the gearing of the mower attached to it, is suspended upon trunnions secured upon the sides of a collar or box working on the axle-tree of the propelling wheels for the purpose of making the cutters secured to the lower end of the frame self-adjustable, and causing them to adapt themselves to the surface of the ground, whether the inner or outer end of the cutter bed be lifted or depressed in passing over slight irregularities in their track. For transmitting the motion from either of the travelling wheels to the cutter bar, a compound or double acting coupling box is used. This coupling box is so combined with the driving wheels and gearing of the machines, that each driving wheel, through the agency of clicks taking into ratchet teeth within the box, may act thereon, independently of the other, to operate the gearing which transmits the motion to the cutter bar crank, and thus permit the machine to be worked to the right or left to cut the grass or other standing crop. The eye of the cutter bar instead of being rivetted or welded on to the bar as usual, is formed by bending a portion of the bar in the shape of an inverted U, so that the connecting rod for operating it will work directly upon the bar, the expense therefore of welding or bolting on an eye, as is commonly the case, will thus be avoided. For regulating and supporting the cutters at a uniform distance from the ground the cutter bed is fitted with others at its outer and inner ends, capable (by reason of a series of holes with which they are provided), of receiving a vertical adjustment. The cutter bed and cutter bar attached thereto, are suspended from the main frame of the implement by a frame hinged thereto, which when unlatched, allows the cutter bed to be elevated and thrown back across the front of the mower

" frame to permit of the machine passing through gateways,  
 " &c."

[Printed, 10d. Drawing.]

A.D. 1861, November 30.—No. 3019.

COOPER, JOHN, and GARROOD, CHARLES.—(*Letters Patent void for want of Final Specification.*)—" Cultivators, horse hoes,  
 " and horse rakes."

1. In cultivators "two or more axes carrying tines are  
 " mounted in a frame, and in order to fix the tines, each axis  
 " has a bar fixed parallel to, and at a short distance from it.  
 " The stem or upper part of each tine is placed against the  
 " axis and its bar, and is secured thereto by a strap (through  
 " which the stem or upper part of the tine passes), and a key  
 " or wedge which is driven through the strap on the side of  
 " the axis and bar opposite to that against which the tine is  
 " held." "The axes are geared together" so that on one  
 being turned, the others also are turned. This is effected by a  
 suitable lever.

2. In horse hoes, the hoes are mounted on levers connected  
 by universal joints to a rod which can be raised or lowered by  
 screws. Behind is a bar with guides, in which the ends of the  
 hoes work. To this bar the handles are affixed.

3. In horse-rakes, each tine is mounted "so that it can turn  
 " freely on a bar," which is preferably hollow. This bar is  
 adjustable as to height. Various parts of the apparatus are  
 hollow, to obtain at once strength and lightness.

4. Improvements in harrows are referred to, but not  
 described.

[Printed, 4d. No Drawings.]

A.D. 1861, December 4.—No. 3039.

BOYD, JAMES EDWARD. — (*Provisional protection only.*) —  
 " Scythes, scythe handles, and apparatus for connecting the  
 " same."

The following is the whole Provisional Specification:—

"The improvements consist in making the scythe handles  
 " (commonly called sneds or snaths) of iron or other metal  
 " pipes, or tubing, or rods, which are to be suitably shaped or  
 " bent either during the progress of tubing or afterwards. The

" aperture in the end of the said metal tube or scythe handle  
 " will be so constructed as to form a case or socket, or receiver  
 " and made capable of fitting, regulating, and holding therein  
 " the tang or heel of the scythe, which is to be previously  
 " made suitable thereto, either by altering the present continu-  
 " ous heel or tang, or by the substitution and introduction of  
 " a separate heel piece or loose tang, to be constructed and  
 " formed to certain angles or shapes, and being rivetted or  
 " fastened on the back of the scythe, made to take the place of  
 " the present continuous fixed tang. The handle will like-  
 " wise be made capable of receiving any form, die, pug,  
 " wedge, ratchet plate, impression, or other contrivance or  
 " apparatus, including the application of the double ratchet  
 " movement commonly known as Boyd's self-adjusting scythe  
 " movement, or any other medium which may be necessary to  
 " regulate and render easy of adjustment to any angle or form  
 " the said tang or heel of the scythe and handle to each other,  
 " the fastenings to be by means of bolts and nuts, screws,  
 " rings, wedges, plugs, solder, brazing, or other appliances."

[Printed, 4d. No Drawings.]

A.D. 1861, December 4 --No. 3045

PULLAN, ABRAHAM and LAKE, WILLIAM.—(*Provisional pro-  
 tection only*)—"Improvements in traction and other engines,  
 " and in wheels for traction engines and other carriages,  
 " and in giving motion to ploughs and other agricultural  
 " machines."

The only part of the Provisional Specification referring to the present series consists of the following paragraph.—

" Also the improvements relate to giving motion to ploughs  
 " and other agricultural implements by means of a cord, rope,  
 " or chain operated by either of a pair of drums or pulleys on  
 " the traction engine, and passing over so as to operate a  
 " pulley or drum, communicating motion to the axle of the  
 " driving wheels of ploughs or other agricultural apparatus,  
 " so as to move such plough or other agricultural apparatus  
 " in either direction. The wheels of the plough or other agri-  
 " cultural apparatus being aided in their grip by suitable  
 " teeth, or other holding means."

[Printed, 4d. No Drawings.]

A D 1861, December 5.—No. 3053.

BUSBY, WILLIAM —(*Provisional protection only*).—Ploughs.

The following is the whole Provisional Specification:—

“ This invention is designed to obviate the necessity for  
 “ shifting the mould board of ploughs from one side to the  
 “ other in ploughing right and left, as commonly practised  
 “ with Kentish ploughs, and in which only one mould board  
 “ has heretofore been used. I propose to effect this improve-  
 “ ment in ploughs, by employing two plough boards or plates  
 “ of metal of the shape of a plough-board fixed together, and  
 “ projecting each side of the shoe of the plough to which they  
 “ are hinged in front, the opposite ends of said plough boards  
 “ or metal plates are connected together by a cross piece  
 “ of metal into which one end of a lever rod takes. The  
 “ fulcrum of said lever rod being upon a pin connected to a  
 “ cross piece of metal fixed to the handles of the plough. I  
 “ also connect another lever to the first-mentioned lever, for  
 “ the purpose of moving the coulter from side to side, accord-  
 “ ing to which of the mould boards are brought into action,  
 “ and which may be effected by moving the before-mentioned  
 “ lever handle from left to right, or right to left, as required.”  
 “ Another improvement in ploughs consists in connecting  
 “ the land and furrow wheels of ploughs together in such  
 “ manner as that they are capable of being raised or lowered  
 “ readily as required, and adapt themselves either to the  
 “ furrow or land in ploughing either right or left.”

[Printed, &c. No Drawings.]

A D 1861, December 6 —No. 3063.

SMITH, WILLIAM —(*Provisional protection only*).—“ Construc-  
 “ tion of horse hoes.”

The following is the whole Provisional Specification:—

“ This invention relates to certain details of construction  
 “ in the horse hoe whereby the efficiency of that implement  
 “ will be greatly increased, particularly as respects the man-  
 “ uerance of the hoe stems in position (without a tendency to  
 “ work loose) and the adjustment of the position of the hoes  
 “ on the hoe bars. These bars I propose to make with double  
 “ flanges, thus *x*, and the lever stems I notch to fit on to the  
 “ double flanges. The hoe stems are to be secured to their  
 “ bars by clips formed with two eyes to receive the stem, and

" a binding screw, tapped into the stem, bears against the  
 " side of the bar, thus holding the notched stem close up to  
 " the flanges. The notches being on the stems instead of, as  
 " is usual, on the transverse bars, allows of the adjustment of  
 " the former at any required distance apart and permits also  
 " of their being fitted to either side of the bars. The trans-  
 " verse bars, of which I propose to use two, as usual, are  
 " connected together near their extremities by bracing cross  
 " pieces, the ends of which are rivetted to the bars. To re-  
 " move all interference to the nice adjustment of the hoes on  
 " their bars, I make the handle adjustable, attaching the  
 " handle irons to the back bar by means of clips, and I am  
 " then enabled to shift the position of the handles laterally to  
 " suit the varying position of the hoes on the bars. To give  
 " increased strength to the double handle irons, I insert  
 " therein a solid stay piece, rivetting the same to the iron.  
 " When the horse hoe is intended to carry an extra hoe,  
 " whether at back or front, I form the crank arm which  
 " carries that hoe with notches, which fit on the flanges of  
 " the transverse bar to which it is to be applied, and by means  
 " of a clip I secure the arm in position."

[Printed, &c. No Drawings.]

A.D. 1861, December 6 — No 3064

HOWARD, JAMES. — (*For a model protection only.*) — "Construc-  
 " tion of hay-making machines"

The following is the whole Provisional Specification. —

" Hitherto in the working of hay-making machines the  
 " accumulation of the grass upon the cross bar of the framing  
 " in front of the tine barrels has been so great as to occasion  
 " considerable inconvenience, the implement having from  
 " time to time to be stopped to allow of the attendant re-  
 " moving the grass from the framing. To prevent this  
 " accumulation, which is caused by the tine barrels tossing  
 " the grass forwards and causing it to lodge on the frame, I  
 " obtain a self-acting discharge of such lodgments before they  
 " add materially as they do at present to the weight of the  
 " implement. In carrying out this object I mount loosely  
 " in bearings upon the front cross bar of the drawing shafts  
 " or framing a transverse roller, on to which the grass tossed  
 " over by the tine barrels will fall.



" This roller being free to turn in its bearings will, as the  
 " grass accumulates, receive a slight axial motion from the  
 " preponderating weight on one or other side of the roller,  
 " and it will thus cause the grass to be dislodged. I may  
 " also find it desirable to apply to the sides of the machine  
 " loose rollers, which acting in a similar manner will throw  
 " off any grass that might otherwise accumulate on the side  
 " framing."

[Printed, &c. No Drawings.]

A. D. 1861, December 11.—No. 3102.

TANNER, HENRY, and PROCTOR, WILLIAM.—(*Provisional protection only*)—" Improvements in the method of applying  
 " manure to growing crops, and also in the machinery or  
 " apparatus to be employed for such purpose."

The following is the whole Provisional specification:—

" Our improvements relate to the method of applying  
 " manure (by preference in the state of powder) to the land  
 " during the growth of various crops, and consist in applying  
 " the same by means of an implement, which at the same  
 " time that it supplies the desired quantity of manure mingles  
 " or intermixes the same with the soil. The machinery or  
 " apparatus which we propose to employ for effecting this  
 " object consists of a combination in one machine or imple-  
 " ment of any suitable drill or apparatus for distributing the  
 " manure with a horse hoe, or with any other cultivator of  
 " like description which stirs up or scarifies the land with-  
 " out inverting or turning it over, so that by this combination  
 " as the manure is supplied by the drill or distributor, it is  
 " immediately stirred in or mixed with the soil without injury  
 " to the growing crops, and a second dressing of manure is  
 " thus applied to the same under conditions highly favourable  
 " to the promotion of a luxuriant growth."

[Printed, &c. No Drawings.]

A. D. 1861, December 18.—No. 3171.

PETERSEN, ASAT.—(*Provisional protection not allowed*)—" System of drainage and irrigation for meadow and other  
 " land."

“ From the head or top of the meadow the main drain is  
“ laid in the direction towards the lowest part of the meadow,  
“ and at a depth from the surface, varying from about 4 to 5  
“ feet, according to the locality and the nature of the soil.  
“ From this main drain side drains branch off at right angles  
“ to the main drain, or in such other direction as the  
“ formation of the surface may render desirable or needful,  
“ and where required, these side drains have again their  
“ tributaries or branches. These side or branch drains are  
“ laid with a slight fall towards the main drain. The  
“ distance from one side drain to the next varies according  
“ to the nature of the soil. At each place where a side drain  
“ enters into the main drain, a shaft or pit is formed reaching  
“ from about 18 inches above the surface of the ground to the  
“ bottom of the main drain, and into the sides of which shaft  
“ the mouths of both the main drain and the side drains open.  
“ On the side towards the off-flow the main drain is fitted  
“ with a valve or sluice, which can be shut or opened, as the  
“ case may require. By means of these sluices the water can  
“ be discharged or admitted and retained in any of the side  
“ drains, and the water raised to and kept at any desirable  
“ level between the bed of the closed sluice or main drain and  
“ the surface of the ground. Shallow regulating ditches are  
“ formed on the surface of the ground immediately over the  
“ side drains, which can be filled in and made to run over  
“ the surface of the meadow, or in which the surplus surface  
“ water may collect and discharge itself into the shafts, which  
“ are for this purpose provided with openings or gates at the  
“ sides above the surface of the ground. In the same manner  
“ as water is admitted, liquid manure may be distributed,  
“ or water charged with fertilizing substances.”

[Printed, *ad.* No Drawings.]

A.D. 1861, December 30.—No. 3254.

TOLHAUSEN, FREDERICK.—(*A communication from Philipp Durand.*)—(*Provisional protection not allowed*)—"Machines  
“ for reaping, gathering, and binding harvest produce”  
“ The following is the whole Provisional Specification:—  
“ My improvements in respect of reaping machines apply  
“ chiefly to the reaper patented by the late W. S. Clark,

" A.D. 1858, No. 720, and consist of a means of keeping the rake vertical to the platform during its entire travel so as to prevent the corn or other grain being jirked, also a spring arrangement for assisting the pinion in its ascending course from the under to the upper side of the endless rack, also a mode of making partly solid the finger guides through which the knife bar works for the purpose of preventing the frequent occurrence of breakage of the said fingers, farther a board, or its equivalent, for removing the impediment, which otherwise the frame of the endless rack in the machine above mentioned, would otherwise oppose to the perfect delivery of the gavel, and lastly, a peculiar way of fixing the said endless rack, or its containing frame.

" My improvements in respect of binding machines relate to the invention patented A.D., 1861, No. 523, and consists mainly in different and various mechanical arrangements for rendering the working of the machine more efficient and practicable especially in regard of the 'twisting claws' and 'gathering arms'.

" I also introduce in this improved binding machine an endless band or tie which is wound off at proper lengths for girdling [?] girdling the gavel or sheaf, and then cut off by a proper self-acting cutting apparatus."

[Printed, ed. No Drawings.]

## 1862.

A.D. 1862, January 1.--No. 15.

HOWARD, JAMES, and BOUSFIELD, EDWARD TENSKI --

" Apparatus applicable to steam cultivation."

The first part of the invention relates to windlasses for steam ploughing, and consists of a method of "regulating the delivery of the slack rope through the agency of the draft rope."

The second part relates to double-action steam ploughs or cultivators. The plough bodies are fitted on two sets of beams, which "instead of rocking on a common centre are mounted on separate axles or fulcrum rods, one axle for

" each set, and the sets of beams are so arranged as to overlap each other at their inner ends. This overlapping is effected by placing the separate fulcrum rods on cross axes of the plough beams one on either side of the centre of the implement." The beams are arranged so that the two sets are capable of "working freely between each other at their inner ends, and by this means the length of the implement is reduced." The beams are raised by chains over eccentric pulleys on transverse shafts. To prevent the "balancing tendency" of the two sets, the pulleys are arranged so that the longer radius of the set connected to the ploughs at work is opposite the shorter radius of the other set.

The implement is mounted on two land wheels and a furrow wheel. The latter is carried by a stud axle, and the former by wheel stalks. Levers on these stalks are joined by connecting rods to a lever ("double-handed") on the other side of the frame, so that both wheels are operated simultaneously to steer the implement.

Cultivator tines may be similarly mounted, instead of ploughs.

[Printed, 1s. 2d. Drawing.]

A.D. 1862, January 10.—No. 71.

CARTER, JOHN.—"Draining plough."

The plough is formed with the ordinary beam and stilt. A deep coulter is mounted on the beam and supported by a stay behind. The foot of the coulter is formed of a conical shape, and behind it are linked "cones or drags," one behind the other in a line. These preferably increase in size from the coulter backwards, the last being the largest. Three is the usual number, but more may be employed. No drain pipes are required.

[Printed, 6d. Drawing.]

A.D. 1862, January 14.—No. 108.

HARRISON, THOMAS, and HARRISON, JOHN GEORGE.—Ploughs.

A presser wheel is mounted on a long axle projecting at right angles from the plough body. This wheel is adjustable on its axle, and can be fixed by screws at any required distance

from the plough. It is "curved angularly, so as to form a "santable seed bed," and has behind it a scraper which is held up by a counterweight and adjusted by a chain, which passes back to the ends of the stilts. The axle is supported by a chain attached to the front of the plough; it is jointed to the plough frame, so as to be free to rise and fall. A "pressing "plate" is also fitted to the tail of the mould board. The edge of the plate is "of a sharp wedge shape, gradually "increasing to a smooth rounded surface." This cutting edge is figured in the drawing as separate from the plate and adjustable therein. The plate "begins to press the furrow "slice just as it is falling into its proper place, and thus "forms the further side of the seed bed," and assists the action of the presser wheel.

[Printed, 10d. Drawing.]

A.D. 1862, January 17 --No. 129.

ROMAINE, ROBERT --"Apparatus to be used in cultivating "land by steam power"

The first and second parts of the invention refer to winding drums; the third part relates to a double-action plough. The main carrying frame is formed of two parts, jointed together on the axle of the bearing wheels. Each of these separate frames has an inner frame jointed thereto which carries the plough bodies, the opposite sets being directed in opposite directions. The ploughs may be raised out of the ground either by rotating the plough beam axially through quarter of a revolution, or by tilting it at its inner end by suitable gearing. This may be operated by hand, or it may be geared to the bearing wheels so as to be operated by the power of the engine. There are castor wheels at each end of the implement, and by these it may be steered. Or the steering may be effected through the main bearing wheels, in the manner described in No. 2003, A.D. 1860.

The fourth part of the invention relates to a dead anchor. This is set in a vertical hole in the ground. Two longitudinal segments of a hollow cylinder are placed together with a central shaft within them. Cams are fitted on the central shaft so as to act against friction rollers on the semi-cylinders when the shaft is rotated axially. The rope is attached to a lever arm on the top of the shaft, so that any strain thereon

rotates the shaft and forces the cylindrical pieces outwards against the sides of the hole, thus jamming the anchor in the hole.

The fifth part of the invention relates to agricultural engines.

[Printed, 3s. 6d. Drawings.]

A.D. 1862, January 21.—No. 160.

BURGESS, WILLIAM.—"Reaping and mowing machines."

The "second motion spindle" which is driven by pinions thereon engaging with both running wheels, is divided into two parts, and there is a collar fitted on it which unites the two parts. The bevil wheel communicating motion to the rest of the gearing is on this collar, and in one piece therewith. The collar and bevel wheel are connected to the two parts of the spindle by ratchets, so that one wheel can run faster than the other. The advantages claimed are that the ratchet wheels and palls are protected from dirt, the bearings for the second motion spindle may be placed close to the pinions driven by the running wheels, and the "ordinary means for" "throwing the knife in and out of gear," may be employed.

[Printed, 8d. Drawing.]

A.D. 1862, January 23.—No. 172.

WALLACE, JOHN.—"Reaping machines."

The cutter is formed of "angular sided blades" on a bar reciprocated in the usual manner. The invention consists in "causing each knife point to traverse at least one half farther at each stroke than the distance between two adjacent knife points or the distance between two adjacent fingers" For this purpose it is preferred to set the fingers closer together than usual. "The fingers are grooved or as it were bent back, the angular or pointed parts of the knife blades" "working through the grooves according to a well-known plan."

In the drawing, the driving gear is shown as consisting of a worm wheel on the bearing wheel axle engaging with a worm on a transverse crank shaft which operates the cutters.

[Printed, 8d. Drawing.]



A.D. 1862, January 24 -- No. 191.

ALISON, JOHN. — "Apparatus for tilling land by steam power."

Some improvements in the engine are dealt with in the first part of the Specification.

The implement employed consists of a frame on three wheels, two on one side and one on the other. The two wheels are mounted "so that they can pivot or incline freely to either side as is necessary in order that the implement may when required be able to travel in a direction inclined to its length." "The axis of the wheel is mounted in bearings carried by a horizontal frame which encircles the wheel, and is made with a point or angle at each end. This frame is separate from the frame of the implement, which simply rests upon it. In the frame of the implement two pins are fixed which project downwards and enter within the circumference of the wheel frame." On starting the implement "the wheel with its frame will lag until the forward pin on the implement frame gets into the front angle of the wheel frame." The wheel frame is thus free to pivot on the pin. When the direction is reversed, the other pin becomes the pivot. Ploughs or other tools are arranged on rocking beams or otherwise in the frame, there being two sets in opposite directions. The implement is steered by "shifting the point of attachment of the hauling band or rope towards or from the centre line of the implement." The traction rope is attached to an eye on an endless band that traverses over pulleys across the front of the frame. One of the pulleys has a hand wheel thereon, so that by turning it the endless band may be set in motion, and the eye carrying the rope thus be shifted to one side or the other. Handles for steering may also be fitted to the "pivot wheels." To assist in guiding the implement there is a small wheel which runs in the last made furrow.

In scarifiers for working by steam power the frame is shaped as an equilateral triangle. There is a central bar, and one half of the frame is hinged thereto, so that it can be turned over on the other half. There are four wheels, two being on the central bar. Of these one is the steering wheel, "being mounted in a pivoting frame and furnished with a lever

"handle." The tines are mounted on the outer sides of the frame. Their stems are free to slide in the beams, but are prevented from descending too deeply. The tines "are so formed as to cut properly in whichever direction the implement be made to travel;" as figured in the drawing they are double. They are mounted so as to be free to incline in either direction, and thus bring the forward cutting edge to bear while raising the hinder one for the time being out of the way. The implement may be steered in the manner described with reference to the plough.

Reference is made to No. 1731, A.D. 1861.

[Printed, 1s. 10d. Drawings.]

A.D. 1862, January 25.—No. 201.

ROBERTS, FREDERICK, and ROBERTS, ALEXANDER—(*Provisional protection only.*) "Apparatus for ploughing or cultivating land."

Ploughs, &c. are fitted on two moveable frames within a wheeled frame. The moveable frames are raised and lowered by racks. The implements are mounted on longitudinal beams sliding on cross bars so as to be adjustable. The draw hooks may be affixed to the longitudinal beams on the outer frame. The implement is steered by a steering wheel at one end. The wheels are adjustable in height, so as to run in the furrow or on the land as required. They may also be revolved on their upright stems, so that the two opposite wheels may be brought into the same line across the frame to assist in turning. Either half of the implement may be used separately.

[Printed, 4d. No Drawings.]

A.D. 1862, February 6.—No. 311.

BAMLETT, ADAM CARLISLE.—"Reaping and mowing machines."

The following is the whole of the Provisional Specification. It comprises all that seems needful for a description of the invention.

"To the first motion wheel or wheels, whether spur or bevel, (which are placed beside the driving wheel or wheels or partly within them) and in order to maintain the gear

" and framework clear of dirt, I fix to the framework a flange  
 " which extends partly beyond the internal wheel or wheels  
 " on its other outsides. The finger bar is attached to the  
 " framework by a hinge, and the shoe is of thin metal bent  
 " into the proper shape. One part of the hinge is formed  
 " of a piece of bar iron bent at both ends and fixed to the  
 " finger bar and shoe by screws or rivets, and the linge  
 " or hinges are so arranged that the distance can be in-  
 " creased or diminished laterally as may be required in the  
 " different operations of reaping and mowing. A little  
 " in advance of the knife there is a swivel wheel, and the  
 " cutters are raised from the ground by a lever which acts  
 " both on the cutter bar and swivel wheel. In order to alter  
 " the cutting height of the knife I fix to the finger bar a  
 " strip of metal bent of the required form. The knife bar  
 " is mounted over the finger bar, and is supported on projec-  
 " tions fixed to the finger bar, and the grass board is attached  
 " to the finger bar by a universal joint, by which means the  
 " width of track to be cleaned may be regulated. To reduce  
 " the risk of damage to the knife from stones I make the  
 " connecting rod of such form that it may be elastic or employ  
 " springs for the same purpose. The reel, which is supported  
 " at one end only, is attached to an upright frame mounted  
 " on an axis on the main frame. A horizontal sliding bar on  
 " which the reel is mounted is attached to the upright frame,  
 " by which means the position of the reel can be readily  
 " adjusted. When it is necessary to make the machine as  
 " light as possible I make the rim and arms of the driving  
 " wheels of wrought iron. In Hussey's reaper I substitute for  
 " the shafts usually employed a triangular frame jointed  
 " to the machine in the same manner as the shafts, to the  
 " front of which frame is mounted a swivel wheel which runs  
 " on the ground, and the cutting height of the knife is regu-  
 " by a lever."

[Printed, 10d. Drawing.]

A.D. 1862, February 11.—No. 350.

WEAVER, WILLIAM HENRY, and GALL, CHARLES — (*Pro-  
 visional protection only* 1—) "Machinery for cultivating, plough-  
 " ing, harrowing or scarifying the land."

Two or more rows of tines, ploughs, &c. are mounted in a suitable wheeled frame, "with these rows or sets secured upon one and the same axis, the ends of which axis are provided with pulleys (quadrant-shaped with a stop at the back preferred) over and secured to each of which is a chain or rope which passes to the draught bars of the machine." The object of this is to enable either set as required to be put into and thrown out of work. The wheels are adjustable in height, and some of them are used as steering wheels. At the end of each bout, "the tines can be reversed by simply taking the power off the draught hook at the one end, and putting it on that at the other."

[Printed, &c. No Drawings.]

A.D. 1862, February 15.—No. 416.

GREEN, JOHN.—(*Provisional protection only.*)—"Signals used with steam ploughs or cultivators."

The following is the whole Provisional Specification:—

"My invention consists in the employment of a cord or rope formed of wire or other material through which signals from the ploughmen or anchormen can be made to the engineer. In order to effect this, I attach one extremity of the cord or wire to a pulley or drum, which is fixed on the framework of the engine or windlass in any suitable manner. The other extremity of the wire is attached to the anchor and plough, and consequently will be extended from one side of the field to the other. By this means the ploughmen and anchormen can signal to the man in charge of the engine or windlass. The wire or cord is kept at the required tension by means of two cog wheels of suitable diameters with corresponding pulleys or drums acted on by a weight. This last apparatus is fixed on the engine or windlass, and is connected with a whistle or bell, or anything which can be conveniently used for the purpose of attracting the attention of the man at the engine or windlass."

[Printed, &c. No Drawings.]

A.D. 1862, February 18.—No. 427.

HASTINGS, JOHN, HENRY, JAMES FREEZER, and WOODS, JOHN, JUNIOR.—(*Provisional protection only.*)—Ploughs.

The following is the whole Provisional Specification :—

“ This invention relates to a double furrow plough, to be worked by two or more horses according to the depth of work to be done, and so constructed as to be capable of being set to any width or depth of work desired, and also of being adapted as a sub-soiler when required for that purpose. The handle of the plough is similar in form and construction to that ordinarily employed and the beam is carried by standard or ‘ loads ’ similar to those now in use. The frame is made of wrought iron, the side pieces being connected together by screwed rods, so as to be capable of being set to the desired width. A complete plough is attached to each side of the frame, one being in advance of the other. For ploughing turnip grounds, or other similar purposes, two ‘ cast breasts or plates ’ are used to turn the mould over, and for ploughing wheat stubbles instead of the two ‘ cast breasts ’ two wooden boards are used to leave the mould open to the atmosphere as much as possible without turning it over. For subsoiling the ground the foremost plough is removed from the frame and a subsoil head is fixed on in its stead, such subsoil head being provided with one or two points or cutting shares to enter the ground. The subsoil head is intended to enter the first vacant furrow, and cut to the required depth of earth, when the hinder plough turns its furrow quite over the former in such a manner that in the next ‘ bout ’ the horses do not walk over the part ploughed. There is also a three lever drag or rake which may be attached to the frame, when required for the purpose of bringing to the surface of the ground twitch grass, and other foul weeds of a like nature that may be in the land.”

[Printed, 4d. No Drawings.]

A.D. 1862, February 18.—No. 434.

FIRTH, WILLIAM.—“ Machinery for digging or turning up soil.”

A carriage is mounted on two pairs of wheels, and drawn by any suitable motive power, horse, steam, &c. The hinder pair of wheels give motion by toothed gearing to two shafts on which are mounted eccentrics. These eccentrics are connected by straps to stems on the ends of which digging blades

are mounted. The eccentrics on one shaft give an up-and-down motion to the diggers; those on the other shaft a to-and-fro motion.

According to the Provisional Specification the entire movement may be effected by a single set of eccentrics.

[Printed, &c. Drawing.]

A.D. 1862, February 20.—No. 457.

WOOD, CHARLES.—“Horse rakes.”

The improvements refer to a method of readily raising and lowering the rake. The driver's seat “is so placed as to act “by its weight and the weight of the attendant as a counter-“balance to the teeth of the rake when they are being raised.” The seat is supported on arms fixed to the shafts, which are hinged to the axletree. There is a treadle below the seat, fitted on a lever which is connected by a link to the rake and serves to raise it. An additional hand lever may also be fitted for the same purpose.

Instead of the above arrangement the axle may form the shaft on which the rake is mounted, and by clutching thus to the wheels the rake may be raised. A lever handle actuating a suitable clutch is fitted near the driver's seat.

[Printed, &c. Drawing.]

A.D. 1862, February 24.—No. 496.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Marie Piorro Amaranthe Ferdinand Mazier.*)—(*Provisional protection only.*)—“Reaping and mowing machines.”

The improvements are classed as under:—

1. Making “the carriage, properly so called,” “distinct “from the mechanism,” so that “the shafts or pole may be “raised or lowered without stopping the work.”
2. The “employment of a suspended box or case for containing all the working parts, to protect them from dust or “dirt.” This case is suspended freely from the axle of the bearing wheels.
3. The “employment of an endless screw” for drilling the cutters. A worm wheel on the main axle engages with a worm on a crank shaft.



4. The "employment below the knife of a foot or shoe" hinged to the frame "for the purpose of varying the height of the cutting blade."

5. "Arrangements for working the knife." This slides in a groove in the finger bar and fingers, and has perforations on it for clearing this groove. It has "a slight frictional contact with the guards, which is maintained by the pressure of springs." The knife bar is "bevelled" to secure it in the groove.

6. "Construction of fingers," presumably making them with the groove above referred to.

7. The "employment of a small roller at the rear of the separator."

8. "Appliances for setting the machine in and out of gear," consisting of a sliding clutch box.

[Printed, 1s Drawings.]

A.D. 1862, February 25.—No. 511.

CRANSTON, WILLIAM M<sup>C</sup>INTYRE.—(*Partly a communication from Walter Abbott Wood.*)—"Machinery for reaping and mowing."

The frame is supported on a pair of wheels, of which one is the driving wheel, the other is rather smaller, and is a little in the rear of the driving wheel, so that the cutter may be "in a line with and a little below the axle of the driving wheel." The finger bar is joined to "a bent bar at or near the line of the centre or axle of the drive wheel, said bent bar being in some cases in turn hinged by rods to the stubble side of the main frame, so that it, as well as the finger bar, may rise and fall, or be raised up and held thus raised" by the driver. The bent bar may be acted on "by means of a cranked axle working within the hollow axle of the ground wheel." The bent bar is connected to the crank, and the other end of the bar is operated by any suitable device. There may be two "ground wheels," one before and one behind the cutters. A rotating conical track clearer is used, fitted so that it is rotated by the act of drawing it along the ground. It is fitted with its smaller end pivoted to the shoe at the end of the finger bar. Its surface "is composed of a series of longitudinal ridges, and the axis of the clearer is inclined to the cutter

“ bar to such an extent as to cause the clearer to rotate.” As figured in the drawing, the track clearer is composed of a “ skeleton cone ” of rods set in a socket which forms the apex.

[Printed, 16d. Drawing.]

A.D. 1862, March 1.—No. 565.

REYNOLDS, SAMUEL GODFREY. — “ Power spading machines.”

A number of spades are mounted at the back of a frame supporting an engine, &c. by which the spades are operated. The spades are carried by a frame pivotted to the main framing, so as to be capable of being raised and lowered. They are mounted on cranks, which have all an equal throw, but are set at different angles on the shaft. The spades are fitted to slide in carriers, and these are supported by springs from the cranks. “ Suspended from the pivots with the cranks are connected is a shaft, the ends of which slide in slots made vertical, or nearly so, in metallic plates. This shaft carries a series of arms or shackle bars of which there are two for each spade carrier; these shackle bars are connected with the crank carriers, and thus as the carriers are elevated and depressed by the cranks, they are also vibrated a certain distance around the shaft, and the spades are caused to move in a curve very nearly vertical while the spade is descending to enter the ground, and then outwards to loosen and break up or turn the earth.” Also instead of employing “ shackle bars ” the “ lower ends of the spade carriers ” may be “ caused to work through slots or holes in the frame or they may be driven by cranks.” The spades being thus moved up and down at different angles and velocities, tend to clear each other; the springs allow the spades to yield when meeting an obstruction. Instead of the above arrangement, the spades may be mounted on “ hoe handles,” and similarly operated. Behind the machine is a harrow, composed of a rotating cylinder with tines which act on the ground between the bars of a fixed frame also carrying tines. This compound harrow is connected to a crank shaft behind the machine, so that it has a to-and-fro movement given to it. The machine is mounted on a pair of wheels running

with the axle, and to enable it to be turned, a "post" with a "foot" thereon is lowered by suitable gearing so as to raise the frame at one side. It thus turns on this post as a pivot. There is a third wheel behind, used as a steering wheel.

[Printed, 1s. 2d. Drawings.]

A.D. 1862, March 5.—No. 598.

HENSMAN, WILLIAM, and HENSMAN, WILLIAM, the younger — "Improvements in steam ploughs and in apparatus connected therewith."

"The improved plough consists of a frame or carriage mounted on six wheels, two land and four furrow wheels. Of these last two are used alternately for steering, being suitably mounted with an interchangeable lever handle. "The plough beams shares and coulter are affixed in pairs on the opposite sides of the beams, which are capable of being lifted and reversed at the end of each course." This is effected by the beams being turned over on a longitudinal central axle. "At the side of the plough there is a sliding rod connected by chains to draw links to lay the drag rope in its proper place, ready for the return course." "The plough beam and coulters have a plain or indented bevel, and the coulter is secured to the plough beam by improved adjustable clamps," formed of two parts jointed together. The "wheel and other slides of ploughs and other implements are improved by making them panelled."

Some "improvements in apparatus for transmitting power from the steam engine to the plough" are also described. These refer to the winding drums.

[Printed, 1s. 2d. Drawings.]

A.D. 1862, March 7.—No. 612.

FOWLER, JOHN, junior, GREIG, DAVID, and NODDINGS, RICHARD.—"Apparatus for cultivating or tilling land."

When the implements are mounted on a rocking frame, the fulcrum of the balance frame is placed below the axis of the bearing wheels. An axle is attached "to the balance frame at two points across it, and at each end of this axle is a standard or slide bar on which the short axle of the carrying wheel is placed." The wheels are turned by a steering wheel to guide the implement.

In rotary cultivators, there is one heavy cylinder with tines and a smaller and lighter cylinder driven from the main cylinder at a greater speed by chains or otherwise. Two such cylinders alone may be used, or four or more may be mounted on a balance frame.

The rest of the Specification refers to winding apparatus.

[Printed, 2s. Drawings.]

A.D. 1862, March 11.—No. 658.

HALL, COLLINSON. "Improvements in implements for breaking up the soil, and in ropes and drums to be employed in the cultivation of the soil by steam."

With regard to the first part of the invention the following is all the description given by the patentee "I take a sharp cutting steel bar, of any convenient width, set at an angle to the line of draught, whereby the depth this cutting bar travels under the surface is regulated; I screw into this bar at intervals sharp cutters which direct the soil, and at the same time raise the weeds and roots to the surface. According to the shape of the cutters, so will the soil be turned."

The second part of the invention consists in forming traction ropes of bars linked together by short links, and in making the drums of a polygonal shape to receive these ropes.

[Printed, 10d. Drawings.]

A.D. 1862, March 14. No. 707.

BOUSFIELD, GEORGE TOMLINSON. - (*A communication from Elias Howe, jun.*)—"Machinery for digging and disintegrating the earth for agricultural purposes"

The apparatus may be mounted in a carriage with shafts to be drawn by animal power, or on a frame on which a locomotive engine is mounted. In the latter case the apparatus is propelled by the action of the diggers. The diggers are mounted in sets three or more round a drum. "The corresponding diggers of each series are secured to a rock shaft, and the series of rock shafts are sustained by two drum heads, which are connected by a tubular shaft, so that diggers, rock shafts, drum heads and tubular shaft constitute

" the compound digging cylinder." The digging blades are set in planes parallel to the axis of the drum. " In order that the body of each digger blade may follow in the track of the entering edge or point, each rock shaft to which the diggers are secured is caused to rock in continuous succession and the extent and period of this rocking is regulated by the following mechanism:—The end of each rock shaft, after it passes into one or other drum head, is fitted with a crank, and the pin of this crank has a friction wheel upon it which travels in a cam formed groove formed in the inner face of a stationary cam which is held in the drum head upon the axle. The form of the cam groove in which the friction wheels of the cranks traverse is such that the rock shaft to which the diggers are secured rock in succession the extent requisite to cause the blades, when penetrating the earth, to follow as nearly as is desirable in the tracks of their entering edges." The cams may be adjusted, to vary the angle of the digger blades. Cleansers are fitted to act on the blades, so as to clear them from soil and break up the clods. In the horse machine fixed bars are used, but in the steam apparatus revolving spikes, working in the opposite direction to the digger blades. In the steam apparatus the hind wheels of the frame are mounted on a crank axle, so that when the digging cylinder is raised, the rims of the wheels and drum are brought in contact and the wheels driven. The cylinders are lifted by means of cranks on their axes operated by winches.

[Printed, 1s. 8d. Drawings.]

A.D. 1862, March 15.—No 718.

HUNTER, JAMES, and SCOTT, ROBERT — Reaping machines.

There are two sets of cutters, one above the other, and so operated as to "act in the manner of scissors." The motion is derived from a corrugated wheel on the main shaft working through a slot in a sliding bar, the movement of which is transmitted to the cutters. The machine is fitted with a tilting platform. It may also be adapted to work with the ordinary single cutter.

[Printed, 10d. Drawing.]

A.D. 1862, March 17.—No. 736.

BARFORD, WILLIAM.—“Rollers for rolling land.”

The rollers are made hollow, so that they can be filled with water to weight them. Each roller may be made in sections with a screw plug to each section through which the water is introduced. The sections are connected by a central hollow tube through which the axle passes. The whole roller is made watertight, as is also the transverse tube.

[Printed, 10d. Drawing.]

A.D. 1862, March 20.—No. 773.

SAMUELSON, BERNHARD.—“Chain harrows.”

All or part of the vertical links of a chain harrow are made of such form as to “present an angular or cutting edge,” and this is effected by “bending the iron or steel of which the links are made so as to present an angle towards the front.” By preference the links are made of iron “of a triangular section bent so that the apex of the triangle shall be towards the outside, and the base inside.”

[Printed, 8d. Drawing.]

A.D. 1862, March 26.—No. 836.

BOBY, ROBERT.—“Hay-making machines.”

The tines are straight, so that they may operate equally well in either direction. The reverse action is obtained “by means of” double pinions which are capable of sliding along their shaft “or axle, so that they may be put in gear with the driving cog wheel affixed to the spokes of the travelling wheels of the machine when required.” The shafts are hinged by a horizontal bar across the front of the machine, and by means of screws on the ends of this bar, the shafts may be fixed at any angle required. The object of this is to raise and lower the tine cylinder, and to raise the machine off the ground so that it may be supported by the tine cylinder alone, to enable the running wheels to be removed.

[Printed, 8d. Drawing.]

A.D. 1862, March 29.—No. 875.

MORRIS, ISRAEL.—“Machine for breaking up or cultivating land.”

“At the back of a steam locomotive engine a horizontal shaft is supported to which a rapid rotatory motion is given



“ by the motion of the engine of the locomotive. The said shaft is at right angles to the path of the engine. A series of eccentrics are fixed on the said shaft, and to the under side of clips encircling the said eccentrics the forks or series of prongs are fixed. A vertical rod is fixed to the top of each of the clips of the eccentrics, and each of the said rods is jointed to a horizontal guide rod turning upon a joint at the back of the engine. By the rotation of the shaft carrying the eccentrics the forks or prongs are made to perform a nearly circular motion in a vertical plane. This motion combined with the advancing motion of the locomotive causes the forks or prongs to enter the land, performing a nearly semicircular motion therein and rising therefrom to re-enter it a short distance in advance of the point at which they last entered it. The eccentrics are so arranged on the shaft as to make the forks or prongs enter the ground in succession and thereby to equalize the resistance. The prongs are of a curved figure.” Six scuffles are fitted to act on the land in front of the forks. The frame carrying the diggers can be raised and lowered by a chain at its outer end. The invention is preferably worked by steam power, but it may be worked by horse power.

[Printed, 10d. Drawings.]

A.D. 1862, March 31.—No. 904.

CRANSTON, WILLIAM M'INTYRE. — (*A communication from James Smith Thayer.*)—"Machinery for cutting corn and other crops."

The bearing of the main driving wheel is mounted in a segmental plate pivotted to a point near the front of the frame, and capable of being fixed in any required position. A band pulley or pinion on the axle of the quadrant is driven by the wheel and transmits motion to the gearing. The driver's seat is immediately over the wheel, and is pivotted to a standard in front thereof. It is also attached by an adjustable bar to the axle of the wheel on each side, a "stirrup" being formed on the bar to receive the foot of the driver. There is no part of the frame outside the driving wheel, which is only supported on one side by the segmental plate. The frame is triangular.

[Printed, 8d. Drawing.]

A.D. 1862, April 3.—No. 945.

AMOS, MARK.—(*Provisional protection only*)—"Harrows."

The following is the whole Provisional Specification:—

"This invention has for its object improvements in harrows.  
 "For these purposes I form or cast numerous short bosses,  
 "each having a square hole horizontally through it; on one  
 "surface of each boss a tooth is formed, and on the opposite  
 "side of the boss another tooth is formed. These teeth I make  
 "of different dimensions in order that a harrow composed as  
 "hereafter explained of these bosses may on one side have one  
 "class of teeth, and on the other side have another class of  
 "teeth, and thus be suitable at different times to perform  
 "different classes of work. On to a square bar I place four or  
 "it may be any other number of these bosses, and on the two  
 "ends of the bar I form suitable hooks, eyes, or instruments  
 "for connecting the bars together end to end. I connect any  
 "desired number of these bars together end to end according  
 "to the width of harrow I propose to construct. In order to  
 "connect together several of the rows of teeth thus produced;  
 "I use chains which have square links at intervals in their  
 "length, according to the distance apart I wish to have the  
 "several parallel rows of teeth, and before coupling the square  
 "bars end to end, I pass each of the ends of these bars as may  
 "be required through the square links of the connecting  
 "chains. By these means parallel rows of teeth will be pro-  
 "duced, running in a direction from side to side of the har-  
 "row, and they will be connected by parallel chains running  
 "in a direction from front to back of the harrow. In placing  
 "the bosses of the teeth on the square bars and in connecting  
 "the ends of the square bars to each other, I so arrange that  
 "the teeth of one row shall not, when passing over the land,  
 "come in the same line with the teeth of the other rows, but  
 "so that the teeth of a harrow may each form a distinct line  
 "on the land from all the other teeth."

[Printed, &amp;c. No Drawings.]

A D. 1862, April 8.—No. 1000.

SHARPE, BENJAMIN—"Harrows and rakes."

1 A harrow is described. Three square or oblong frames carrying teeth are attached side by side to a draught bar. These frames are hinged in a line transversely across the

implement, so that one half at a time can be raised. Over each frame is a perforated plate, so fitted that when the half frame is raised the teeth are cleared by passing through the perforations in the plate. A series of bars, one behind the other, follow the frames, and to each bar is attached a chain the loop of which drags on the ground. These bars are attached each to the one in front of it, and the front one is attached to the draught bar.

2. The horse rake figured has several sets of teeth, mounted on radial arms from a sleeve on the axle. The radial arms are hinged, so that any of them may be turned up out of use. Each set of teeth acts in turn, it being held by a catch until a cam on the axle, by striking the end of a lever, releases the catch, and suffers the sleeve to rotate with the axle, thus raising the teeth and suffering the collected crop to remain on the ground while another set of teeth comes into action. It is also stated that "the teeth of horse rakes may from time to time be caused to deposit the accumulation of materials raked up by them, a cam or projection is applied on one of the wheels, which in its rotation acts on a lever which causes the teeth to be lifted and held off the land until they have deposited their accumulation."

[Printed, 10d. Drawing.]

A.D 1862, April 11 --No 1052.

HOWARD, JAMES, BOUSFIELD, EDWARD TENNEY, and PHILLIPS, THOMAS.—"Apparatus applicable to steam cultivation"

1. Improvements in windlasses for steam ploughing

2. Improvements in travelling anchors, the object being to enable them to be used "in short fields where (the lateral traverse of the anchor depending on the length of rope run over the pulley) the automatic traverse of the anchor is not sufficient to enable the plough or other implement properly to enter new ground." The anchor is mounted in a frame with a pair of bearing wheels, the wheels having broad blades on their rims to hold the ground. Motion is transmitted from the large horizontal sheave to a transverse shaft above, which has two universal joints thereon, one on each side of the central bevel wheel by which it is rotated. Each end of this shaft is free to rock up and down, and thus a pinion thereon

can be brought in and out of gear with a spur wheel on the bearing wheel. There are two such spur wheels, one above and one below the pinion, so that the bearing wheel can be moved in the same direction when the sheave is running in either direction. The necessary movement is given to the transverse shaft by a hand lever. Both wheels can thus be driven together, or one only, to steer the apparatus. The anchor is fixed in position by sliding blades, worked by screws or otherwise.

3. Improvements in rope porters. The pulley for the rope is mounted on the end of a lever pivotted to the carriage. It is held in position by a catch, and to let the rope off the pulley the lever is raised, and the end with the pulley depressed.

[Printed, 1s. 8d. Drawings.]

A.D. 1862, April 14.—No. 1073.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Ernest Clement.*)—(*Provisional protection only.*)—"Reaping and mowing machines."

A delivery apparatus is formed of an endless chain fitted with rakes so as to "pass above and below the platform." It is supported by "a fore carriage in the form of a sledge" carrying the finger beam and knife and jointed to a hind carriage mounted on wheels." The fore carriage is "supported upon two metal bars" and "at the rear by a train of wheels fixed to the frame, the side bar of which has a groove formed in it covered by plates forming sockets and uniting the frame and one of the metal bars." The position of the bearing wheel may be altered apparently by shifting it along its axle-tree, to "equalize the resistance offered by the crop." The divider has a cutting blade thereon. The rake chains are driven from the main wheel. The position of the pole may be varied. The driver's seat is at the back, and to the left, to counterbalance the cutter, &c. (which is therefore presumably at the right). The seat may be weighted for the same purpose.

[Printed, 4d. No Drawings.]

A.D. 1862, April 19.—No. 1136.

DENNISON, ROBERT.—"Reaping and mowing machines."

The machine is to be pushed forward by a horse harnessed in shafts behind. Corrugated disc wheels on the axle of the

bearing wheels give a reciprocating motion to levers by which two sets of cutters are operated, one over the other, so that they have a shearing action. The cutters may be formed of toothed blades which reciprocate across the front of the machine, or of separate shear blades pivotted to a bar, and operated by having one blade of each pair of shears pivotted to one of a pair of bars reciprocated by the levers. Behind the cutters is a platform with openings therein through which the cut crop is delivered by rakes on endless chains running from side to side of the machine. The machine is balanced on its bearing wheels, and the shafts are pivotted thereto, so that the height of the cutters can be regulated by altering the angle of the shafts.

[Printed, 8d. Drawing.]

A.D. 1862, April 22. —No. 1174.

BOBY, ROBERT. — "Apparatus for rolling or crushing land "

The roller figured is formed of three sections. The middle section runs free on the axle, and the end sections are connected thereto by ratchets. Or the centre section may be fast on the axle, and the end sections loose. A weighted scraper is fitted to clear the surface of the roller. The ends of the axle work in "properly lubricated bearings or groms" "boxes." The bracket arms of the frame have "bushes or" "pairs of bearings" so that any worn part may be replaced

[Printed, 10d. Drawing.]

A.D. 1862, April 24. —No. 1200.

BELDING, GEORGE WASHINGTON. — (*A communication from Willis Churchill.*) — (*Provisional protection only.*) "Harrows" "or cultivators."

"Both single and double frames are employed." "The" "double frame consists of three pieces of suitable dimensions, the two outside pieces, which in use diverge from the centre piece, are made adjustable, and may be brought parallel for convenience of transportation." "The drawing power is" "applied to the centre pieces, and to this is fixed the front" "tooth." "The single form consists of one straight piece, to" "which is fixed one row of teeth only, this form is drawn by" "an arm attached to the centre of the harrow, and carried" "forward more or less diverging from the body of the imple-

ment according to the depth of cultivation required. The teeth are constructed with broad thin 'coulters' descending in a backward direction." A mould board is attached to each coulters, and to the front tooth two such boards. The lower edge of the 'coulters' extends slightly below the mould-board, in order to raise the implement over stones," &c.

[Printed, 4d. No Drawings.]

A.D. 1862, April 25.—No. 1211.

DRUMMOND, PETER ROBERT.—"Revolving rake for lifting objects from the ground."

The implement is intended for lifting and collecting automatically into a cart, "stones, hay, straw, corn rakings, fets, turnips, potatoes," &c. A semicylindrical receptacle is hung between a pair of wheels. On the axle of the wheels a pair of the revolving rakes is also mounted. These, as they revolve, clear the collected material from the teeth of a "trailing rake," mounted behind the implement, and deliver it into the receptacle. They are formed so as to swivel round at the top of their revolution and thus let the material fall more freely. The tines of the trailing rake are suspended on a cross bar, and may have springs upon them. The spokes of the wheel are screwed into holes in the boss, and the tire is fixed by screws to the ends of the spokes. The rake teeth may be of various shapes, to suit the work to be done. "When the cart or cradle is made of a rectangular form the trailing rake is similarly shaped, and the lifting rake then turns upon a pin working in a slotted groove in the axis of the frame."

[Printed, 10d. Drawing.]

A.D. 1862, April 25.—No. 1221.

FISKEN, WILLIAM.—"Apparatus for cultivating land by means of steam power."

The invention refers to the use of "two progressive combined anchor windlasses" for ploughing, &c. One such apparatus is placed at each side of the field, and the power of the engine is applied by an endless rope "which first passes round a double-grooved sheave on the engine, then round a similar doubled-grooved sheave on each anchor windlass."



Each apparatus consists of a wheeled frame, the bearing wheels of which are fitted with broad cutting rims, which enter the earth, and hold therein. The traction rope from one end of the implement is wound on a drum suitably mounted in the frame and driven from a portable engine. The rope from the other end of the implement is similarly wound on a windlass at the opposite headland. A smaller drum has wound on it a rope attached to a fixed anchor, so that by winding on it the apparatus is moved along the headland. By means of a clutch, either this drum or the main drum can be geared with the driving shaft, so that the same movement which stops the progress of the implement causes the windlass to be traversed along the headland. The opposite windlasses are connected by an endless rope running over pulleys on the driving shafts, and if required guide pulleys for this rope are mounted on the frame.

[Printed, 10*d*. Drawing.]

A.D. 1862, April 29.—No. 1258.

CHILDS, DAVID MONROE.—(*A communication from James Mills Roy, John Hooper Bedstone, and Albert Ellis Bedstone.*)—"Reaping and mowing machines."

The description is not very easy to follow, the drawings attached to the Specification being somewhat rough, and the lettering confused.

A double set of reciprocating cutters is used. These are operated by "knobs" passing through a "curved device" in the main bearing wheel, the motion being transmitted through a lever. A reel is shown in one of the drawings. Behind this a rake is arranged to swing over the platform, and carry the cut crop to a "bundle rack," where a band is twisted round it, the ends of the band being forced into the sheaf. This is effected automatically by mechanism figured and described in the Specification, to which reference must be made for further explanation.

[Printed, 1*s*. 3*d*. Drawings.]

A.D. 1862, April 29.—No. 1262.

NEWTON, WILLIAM EDWARD.—(*A communication from Louis Adolphe Faure.*)—"Mowing and reaping machines."

The driving gear is enclosed in a case or box, fixed on the framing, and forming part thereof. This case is in two parts, bolted together, and it has doors for inspecting and lubricating

the apparatus. The cut crop is received on an endless apron, which delivers it at the side. Behind the apron are similar bands projecting beyond the apron. These receive the ears of the corn and support them after the stalks have fallen on the ground. The corn is thus turned round and laid in a direction at right angles to that in which it would naturally fall. The apron may have strips of leather, &c. fixed thereon.

Waterproof fabric is by preference employed for the bands and apron. The arms of the reel are either hinged, or attached to the shaft so as to slide therein, and thus be capable of retraction or elongation.

[Printed, 10d. Drawing.]

A.D. 1863, May 2.—No. 1302.

GILL, JAMES WALLER.—(*Provisional protection only*).—"Apparatus for turning up and pulverizing the soil."

A fine cylinder mounted in a suitable frame so as to be adjustable in height is drawn by a traction engine and at the same time revolved thereby. The tines or plates may be fixed on the cylinder or eccentrics within the same, so as to be protruded from and retracted within it. A scraper is fitted above the cylinder. Behind the cylinder is a perforated screen which "causes the coarse particles of the soil to fall down first, while the finer particles pass through and lie on the surface." "A series of rammers" may be placed to follow the pulverizer. Instead of a traction engine, the apparatus may be connected to a carriage drawn from a stationary engine.

[Printed, 4d. No Drawings.]

A.D. 1862, May 5.—No. 1342.

COOKE, BENJAMIN.—"Implement for cutting turf."

The implement is to be used "for cutting turf or paring land." It is in construction "somewhat like a subsoil plough." In front there is mounted a roller to act on the turf before it is cut. Behind this is a coulter with a broad horizontal share of width corresponding to that of the turf to be cut. A wheel is fitted to run along the line of the last cut of the coulter, and guide the implement. A scraper is mounted so as to clear the roller. The implement is drawn by horses like a plough, and guided by stilts behind.

[Printed, 10d. Drawing.]

A.D. 1862, May 6.—No. 1355.

RANSOME, JAMES EDWARD, COPPING, WILLIAM, and  
LANSDELL, LAWSON.—HARROWS

1. The teeth are fastened to the frame independently of the connections which are used to join together the framework. They are attached to the transverse bars of the frame by means of "metal loops or clasps, which pass round the teeth, and "are tightened up by means of nuts, cotters or otherwise. "Between the tine or tooth and the bar a casting having a "groove in it is interposed to form a suitable bed for the "tooth; the casting is prevented shifting on the bar by lugs "or otherwise, and it is securely held by the loop or clasp "which embraces the tine or tooth." "It is preferred to "make the tooth square in section and to have V-formed "grooves in the bed casting to correspond therewith." Or the bar may have grooves formed in it to receive the teeth, the castings being dispensed with.

2. The harrow is formed so as to allow a certain amount of play to the frame. Each tooth "is attached to an axis at "some distance in front of it by a bar or lever which is free "to turn on the axis." This axis consists of a transverse bar. The tooth may be one piece with the bar, or may be rigidly connected thereto. "The axis of the leading tines or teeth "of the harrow is immediately connected with the draught, "and the axis of the bars or levers of each following row is connected to the ends of the bars carrying the teeth. "Or "the teeth of each row, with the corresponding bars or levers, "may be formed together as a rigid frame," and these frames jointed together. The harrow may be drawn either end foremost.

Printed 1s. Drawings.]

A.D. 1862, May 7.—No. 1369.

BOUSFIELD, GEORGE TOMLINSON —(A communication from  
*Eliza Howe, junior*)—"Applying steam power to tilling land  
"by means of a digging locomotive"

Partly improvements on No. 707, A.D. 1862

The frame has mounted thereon an engine and boiler. Behind is a cylinder fitted with digging blades. This is driven by the engine and serves to propel the implement. Behind the digging cylinder is a cylinder with clearers or scrapers.

this is revolved by gearing from the engine. The action of these tends to turn over the clods of each, as well as to clear the digger blades. The front wheels are mounted on stems and serve for steering wheels, a hand wheel being fitted to operate them. The wheels are set at the side of their stems, so that they are moved in a larger curve. The hind bearing wheels are mounted on cranked axles, and each axle can be raised and depressed by a lever, so that the wheels can be set to different heights. A spur wheel on each bearing wheel comes into gear with a pinion on the digging cylinder axle when the wheel is at its lowest point, and the wheel is thus driven by the engine while the other wheel may be left free so that the implement rotates thereon as on a centre.

Some improvements in the engine are also described.

[Printed, 2s. 3d. Drawings.]

A.D. 1862, May 8.—No. 1379.

**FWLER, JOHN, and KING, JOHN.**—Steam ploughing.

The first part of the invention relates to a method of steam culture by using a "hauling carriage" separate from the engine, and carrying winding apparatus driven by the engine. The "hauling carriage" is connected to the engine and moves therewith; it is moved along the headland by winding up a chain and carries the engine with it. It may also be moved by giving motion to the bearing wheels. It is held in position by disc wheels or blades. It is steered by altering the angle of the wheels at one side. By preference a drum is used having "nipping instruments" thereon, and round which the rope takes half a turn. Two winding drums may also be used, with suitable arrangements for throwing them into and out of gear alternately. The "hauling carriage" may be held in its place by being coupled to the side of the engine, the weight of which holds it steady.

2. The anchor carriage is mounted on four disc wheels, three at the back and one in front. The two end wheels are mounted so that they can be turned to steer the apparatus. This is effected by a shaft along the back of the frame with right and left-handed screws thereon, which engage with toothed quadrants on the wheel stems. A chain is led over a chain wheel, and secured on either side by fixed anchors. On throwing this chain wheel into gear with the sheave round which the traction rope runs, the carriage is drawn forward.

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3. The pulley of a rope porter is mounted on an arm projecting from the main frame, and hinged thereto. The implement in passing strikes against this arm and forces it out of the way. It is brought back by a spring, or a second similar arm is brought up behind the implement, and the rope placed on the pulley by hand. The return rope is laid in the axletree of the main bearing wheels, which is hollow for the purpose. To admit the rope there is an opening in the rim of the wheel.

[Printed, 2s. 10d. Drawings.]

A.D. 1862, May 13.—No. 1435.

LOPEZ, PIERRE MARTINEZ.—Drill.

In front of the frame a set of coulters are mounted on a cross-bar, these being adjustable to different distances apart. Each coulter slides in a block on the cross-bar, and is suspended from an overhead lever pivotted to a standard on the frame. The seed is delivered from a hopper to a horizontal cylindrical trough within which a shaft rotates. Along the bottom of the trough is a line of holes, and over each hole is a corresponding hole in an inner cylinder on the shaft. Weighted pistons work up and down the holes in the inner cylinder. These receive the seed from the hopper above and carry it round till it comes opposite the bottom aperture, when the piston falls and forces the seed into a shoot below leading to the drill. A curved plate is fitted to sustain the weight, which slides on the piston rod till the pressure is required. Scrapers are mounted at the back to cover the seed with soil.

[Printed, 6d. Drawing.]

A.D. 1862, May 26.—No. 1573.

WORBY, WILLIAM.—Reaping machines.

Improvements on No. 1379, A.D. 1861.

The machine described in the above Specification has a self-acting side delivery. The objects of the present invention are (1) to enable the platform and cutters of such a machine to be turned up to enable it to pass through gates, &c.; and (2) to cause a series of rakes which "act as an ordinary fly for laying" the corn, and afterwards removing it when cut, at the sides of the platform in bundles, to act in concert with the rise and fall of the platform and cutting parts."

The platform, &c. is fixed to a bracket, and this is hinged to the frame. A lever attached to this bracket is united by a link to a lever pivotted to the frame. A vertical rod connected to this second lever supports the "cam ring" by which the required movement is given to the rakes. This ring is hinged to a standard on the frame.

The rake heads, instead of being rigidly attached to their arms, are connected thereto by means of spiral springs.

[Printed, 1s. 2d. Drawings.]

A.D. 1862, May 26.—No. 1577.

HOLMES, JOSEPH ELLICOTT.—(*Provisional protection only.*)—

"Machinery for digging or cultivating land."

Spades, &c., are mounted so as to slide in blocks carried by the bearing wheels of a carriage, and have the ends of their stems working in suitable cam grooves in such a way that they are driven down in the ground when the bearing wheels are rotated by an engine mounted on the carriage. The mechanism by which this motion is effected is not described at length. As the spades are withdrawn through the blocks, they are cleared from soil. To raise the spades clear of the ground for purposes of transport, the cams are turned round with the smaller radius downwards. A catch is arranged to hold the cams in this position. The wheels may be driven separately. There is a steering wheel in front. The implement may also be drawn by horses or by a rope from a stationary engine.

[Printed, 4d. No Drawings.]

A.D. 1862, May 26.—No. 1578.

HOLMES, JOSEPH ELLICOTT.—(*A communication from George*

*Remsey*)—(*Provisional protection only.*)—"Machinery for digging or cultivating land."

The invention consists in the employment of a "rotary digging or cultivating instrument" driven by an engine on the same framing or otherwise. The instrument consists of a shaft provided with a series of screw blades. "This shaft is mounted in bearings at the end of a pair of rocking levers, which have their fulera on the axle-tree of the running wheels, and rotary motion is communicated to it by means of a pulley or chain wheel on one end of the axle. The



" other ends of the rocking levers are connected to a bar or block, through which passes a vertical screw shaft, by turning which one end of the lever is raised or depressed, and the opposite ends which carry the shaft of the digging implement are depressed or elevated when desired. The outer ends of the rocking levers are also provided with quadrant arms, in which are made holes to receive pins, whereby the rocking arms and digging instruments may be kept at any point of depression or elevation required. In front of the rotary digging instrument are placed a series of coulters which may be raised and depressed with the rotary digging instrument."

[Printed, &c. No Drawings.]

A.D. 1862, May 30.—No. 1623

FOOTMAN, WILLIAM.—(*Provisional protection only*).—"Treatment and use of sewage and liquid manure."

The invention refers to an "outlet" system for draining land, and an "inlet" system for irrigating it with sewage. The sewage is received in tanks, whence it is carried by pipes through the ground to be irrigated. This system of pipes alternates with a system of drainage pipes laid "across the land a few feet below the surface of the ground, but with much smaller intervals between the rows than is now usual, and at as small a gradient as possible, leading to a ditch or other ordinary outlet." The pipes for irrigation are "a few inches only beneath the surface of the ground, and are fed from main or supply pipes leading from the tank." On inclined ground the main pipe may be carried "down the incline in a zig-zag direction and feed inlet pipes made to issue from the angles." Or the pipes may all "follow the contour levels of the land." The pipes used by preference for the "inlet system" are made "with projections running the whole length on each side and bending downwards so as to form lateral and inverted channels on each side."

[Printed, &c. No Drawings.]

A.D. 1862, May 30.—No. 1634.

EDDINGTON, WILLIAM, junior.—"Apparatus for draining and tilling land."

1. Improved drain plough. This, from the drawing, appears to be a steam plough. The coulter is adjusted in the beam by a screw. The fore-part of the beam is connected to the fore carriage by a screw, and gearing is arranged with the wheels to turn a nut on this screw and thereby raise or lower the end of the beam. The share may thus be gradually lowered to cut an inclined drain in level land, or a level drain in on a slope.

2. Instead of a rope to draw the tiles into the ground, a wire is used on which a "series of short sockets or pieces" of wood is threaded. Similar pieces may also be used with an ordinary rope.

3. Improved cultivator. The frame is of the usual character, but there are "one, two, three or more double moulding ploughs," "so as to traverse and operate on the land immediately in the rear of the scarifiers." These are fitted "in manner precisely similar to scarifiers." They are intended to "mould up into ridges the land previously lightened." The frame is triangular, mounted in front on a fore carriage with a pair of wheels, and by these the depth at which the tines act can be regulated. The hinder part is mounted on a wheel with "a cranked axle and hand lever, by which it can be elevated "or depressed" to regulate the action of the tines "or raised out of the ground in running back." In backing the tines and ploughs "will rise out of the ground by oscillating on their suspending bolts."

[Printed, 16d. Drawing.]

A.D. 1862, June 2.—No. 1660.

BAKER, JOSEPH.—(*Provisional protection only.*)—Pumps.

"According to one modification the pump consists of a brass barrel, to the lower end of which is attached a ring, which is connected by two curved stays to a foot plate beneath. To the lower part of the pump barrel is screwed the box or chamber in which the inlet valve is fitted. The extremity of the valve box has screwed to it a short length of bent tubing, to the outer end of which is connected the flexible tubing, which serves to convey the water from the source of supply to the pump. A disc valve is fitted in the inlet chamber; this valve rises with the repeated motion of the piston, and the water flows into the barrel. The piston

" is of the ordinary kind, and is attached to a rod passing out  
 " through a stuffing box at the upper end of the barrel, and  
 " terminating in a cross handle or hand lever. The downward  
 " pressure of the piston forces the water through a laterally  
 " projecting tube, which communicates with the outlet valve  
 " chamber. The outlet valve opens upwards into a small  
 " chamber of a spheroidal figure, the upper part of which  
 " communicates with the outlet tube; to this is screwed the  
 " flexible tube and jet piece for directing the stream of water  
 " in any required direction." " With minor modification these  
 " pumps may also be adapted for distributing liquid ma-  
 " nure," &c.

[Printed, 4d. No Drawings.]

A.D. 1862, June 3.—No. 1676.

FINCHAM, JOHN.—" Mechanism useful for facilitating the  
 " repairing of roads and ways also applicable to the tining of  
 " lands."

The apparatus is intended principally for cleansing roads. When used for agricultural purposes certain scrapers and rakes are removed, and harrows, &c., attached to the frame instead. This frame is composed as follows. In front is an axle with a pair of bearing wheels. To this three longitudinal beams are connected, each of which is double so as to form a guide. In the centre beam is a sliding block carrying a wheel; this can be clamped at any point required. A similar double cross bar is mounted behind the front axle. A bar is fitted diagonally across the frame at each side to support sliding in the front and central side bar, so that the angle can be varied. To these bars the harrows, hoes, scarifiers, &c., are attached. The implement is drawn by a pair of shafts swivelled to the axle.

[Printed, 6d. Drawing.]

A.D. 1862, June 4.—No. 1681.

ALLCOCK, THOMAS.—" Construction of horse rakes."

1. Instead of the wheel being formed with a boss on the outside, it is made with a short axle fitted to the nave and turning in a hollow boss carried by the frame. A set screw through this boss fits in a groove in the axle, and prevents it from slipping.

2. The height of the teeth is regulated by supports which can be fitted at any required height on bars carried by the frame. The lever bar on which the teeth rest is held by these supports. There is a presser bar along the top of the teeth to keep them to their work.

[Printed, 1s. Drawings.]

A.D. 1862, June 4.—No. 1690.

NEWTON, ALFRED VINCENT.—[*A communication from David Osborne.*]—"Grain and grass harvesters."

The following are stated to be the "main points of novelty" in the machine:—

1. The driving wheel is mounted on a "vibrating segment plate" jointed to the main frame, and "by means of an arc or rim rigidly attached to the framing controlling the vibrating motion of the segment plate."

2. The driver's seat is hung from a standard on the frame, and connected to the axle of the driving wheel by "strap pieces," carrying a support for the foot. The object of this is that the weight of the driver may balance that of the cutters, &c.

3. The cutters are "of the scoloped kind;" the fingers are slotted, and the rivets holding the cutter blades to the bar pass through the slots. This is to clear the fingers from clogging matter.

4. "The rake is jointed to an arm hinged to the main framing, and it is operated by means of a connecting rod and link attached to a crank shaft," which can be thrown in and out of gear by a hand lever. There is a ball-and-socket joint on the crank shaft to allow for variations of level. There is a catch to hold the rake steady.

5. There is a guard over the driving gear to protect it from dirt.

6. The reel is supported at one side only. Its standard is hinged to the main frame, and can be raised and lowered, "the fulcrum of the post being the axle of the spur pinion which gears with the teeth on the driving wheel." On the same axle is the pulley of a band driving the reel, this band being kept tight by a tension pulley carried by a stud on the standard.

7. When the raking is done by hand, the attendant's seat is placed "with regard to the cutting apparatus and the delivery side of the platform that he will be enabled to draw and deliver the 'gavel' into an unobstructed space by an easy swing of his arms "

8. The finger bar is of angle iron, and the fingers are attached thereto by "horizontal bolts "

9. There is a "hand lever and suitable catch," combined with a "transverse rod and lifting frame," by which the driver can adjust the height of the cutters.

10. A runner "of peculiar form " is fixed on the main frame, it being "curved upwards, so that it may rise up on to and crush down the cut grass," and thus form a smooth track for the next round.

11. The sickle bar is attached to a "crank wheel that has a series of wrist pin holes at various distances from its centre of motion, for the purpose of varying the length of stroke of the sickle bar."

12. The "outer shoe" is in two parts so that the under part may be readily unshipped from the upper, the nose of the upper part fitting into a socket in the under part " In the rear of this outer shoe is a track-cleaver, composed of tapering curved steel fingers which lie in the line of traction."

[Printed, &c. Drawings.]

A.D. 1862, June 10—No. 1731.

ALISON, JOHN — "Improvements in harrows, and in the apparatus for steering or guiding of such and other agricultural implements."

A suitable frame is mounted on one bearing wheel at one side, and two steering wheels at the other. The opposite ends of the implement are similar, and it is intended to travel in either direction. There is a sowing apparatus at the centre of the frame with flexible tubes leading to coulters. The stems of these coulters each enter between two vertical plates carried by the frame, and there is a transverse pin on the end of the stem which enters between guides on the plates; the coulters are thus able to rise and fall, following the irregularities of the ground by pivoting about the pins which the guides retain; the guides on the plates are in the

“ shape of an inverted V, thus A ; and in whichever direction  
 “ the implement travels, the pins of the coulters are in the  
 “ leading ends of the guides. When the direction of motion  
 “ of the implement is changed, the coulters first assume a  
 “ vertical position, and then (being struck by a stop on the  
 “ frame) they are caused to fall over to the other ends of the  
 “ guides, when they operate as before, both sides of the cutters  
 “ being of the proper form for working ” In front and  
 behind the cutters a roller is mounted. Beyond these, at the  
 ends of the frame, are transverse shafts, three at each end,  
 carrying tines. These are caused to rotate and remain fixed  
 in turn, each shaft alternating with the others. This is  
 effected by stops on the main bearing wheel striking against  
 the ends of bell-crank levers which by means of chains raise  
 weights working in guides and serving as stops for the tines  
 on the cylinders to strike against. The object of this is to  
 allow the tines when rotating to clear themselves from grass,  
 &c., they have collected while they were fixed.

The steering wheels are mounted with stud axles working  
 in horizontal slots near the base of vertical standards suitably  
 fitted for steering. The wheel runs back to the hinder end  
 of the slot and thus acts as a sort of castor wheel.

[Printed, 10d. Drawing.]

A.D. 1862, June 10.—No. 1732.

INGLE, JOHN BROUNCKER.—(*A communication from William  
 Henry Seymour and Dayton Morgan.*)—“ Reaping and mowing  
 “ machines.”

The invention relates to “ sweep rakes in harvesting  
 “ machines which traverse on a vertical axis behind the cutter  
 “ bar, and have crank arms which turn in horizontal bearings  
 “ for the purpose of lifting the rake and holding it above the  
 “ grain while it is moving forward toward the cutters.”

1. “ Communicating motion to the rake mechanism from  
 “ the main driving shaft or other suitable shaft of the machine  
 “ by means of a yielding clutch so arranged by a combination  
 “ of inclined teeth on the moveable part of the clutch with a  
 “ pin or pins or opposite inclined teeth fast to the driving  
 “ shaft, and a spring to keep the two parts of the clutch  
 “ together that the clutch only operates to move the  
 “ mechanism of the rake when the harvesting machine is



"drawn forward, the rake ceasing to operate when the machine is backed."

2 "Communicating the traversing motion of the rake to the vertical turn post or traversing axis of the rake from a crank turning on a horizontal axis, and geared to the main driving wheel by means of two connecting rods jointed to each other by a compound or universal joint, one of the rods being connected to the wrist pin of the driving crank and the other to the horizontal arm of the vertical turn post, the end of the latter rod extending through an eye guide, in which it plays back and forth with sufficient freedom to admit of the gyration of the crank end."

3. "Combining with a rake arm, supported by and turning in horizontal bearings in a horizontal traversing arm, vibrating on a vertical axis, a lifting arm projecting from the rake arm, a stop placed on the back part of the frame of the machine, and a self-acting holding or rotating mechanism attached to and traversing with the rake arm and traversing arm, and independent of the main part of the machine" "for the purpose of lifting the rake at the end of its back motion, after it has discharged the grain from the platform, and sustaining the rake in an elevated position above the accumulating grain on the platform while moving forwards." Also "tripping the latch by suitable means at the end of the forward motion of the rake toward the cutters for the purpose of permitting the rake to descend to the platform at the proper time to commence raking" The above motion may also be obtained by a cam acting against a roller.

4. "Driving a sweep rake from the cutter bar shaft" by means of "a worm on the cutter bar shaft, a worm wheel carrying a crank, and rotated on a vertical axis by the worm wheel on the cutter bar shaft, and a connecting rod from the horizontal traversing arm which carries the rake to the wrist pin on the crank carried by the worm wheel"

[Printed, 1s. 10d Drawings.]

A.D. 1882, June 11.—No. 1744.

HOLMES, JOSEPH ELLROTT.—(*A communication from Orman (no.)*)—(*Provisional protection only*).—"Machinery for cultivating or harrowing land."

The teeth are preferably "curved at their points, and they  
 "are arranged radially round central bosses which are  
 "mounted loosely on horizontal shafts that are set diagonally  
 "or at an angle to the line of draught." The act of drawing  
 the implement over the ground causes the bosses with the  
 tines to rotate. "The diagonal shafts are set at opposite  
 "angles, and at one end are brought nearly close together,  
 "while the other ends diverge, and are held in position by a  
 "segmental bar" The implement is drawn by "a loop,  
 "hook, or eye placed near the apex of the angle formed by  
 "the meeting of the diagonal shafts." To take the strain off  
 these, the draught hook may be attached to "a central  
 "draught bar, which extends from the front to the segmental  
 "bar at the rear." "Fixed broad shares, cutters, scarifiers,  
 "or other analogous tool" may be fitted to the draught bar  
 or the segmental bar. Instead of the above arrangement, the  
 horses may be fixed to the shafts, and the latter revolve in  
 suitable bearings. The angle of the diagonal shafts may be  
 arranged to be varied.

[Printed, 4d. No Drawings.]

A.D. 1862, June 12.—No. 1747.

SPIGHT, ISAAC.—(*Provisional protection only*)—Horse hoes.

The following is the whole Provisional Specification:—

"My invention relates to improvements upon a patent  
 "granted to me on the 22nd day of September 1859, and being  
 "No. 786, for improvements in horse hoes, and relates par-  
 "ticularly to a method of regulating the depth at which the  
 "hoes work when used on uneven ground, such as hill sides  
 "or on ridge land. In my former patent the hoes were  
 "attached to levers connected with a revolving shaft working  
 "in a slide frame having bearings at each end and which shaft  
 "could be raised or lowered as required for different kinds  
 "of corn or roots. My present improvement consists in  
 "suspending the shaft or bar to which the hoes are attached  
 "upon a bearing at its centre instead of at each end, so that  
 "when one end is raised by turning a handle or otherwise as  
 "described in my former Specification, the other end is  
 "lowered in a corresponding degree, and thus when working  
 "over ridged or curved surfaces or along what are called

" 'lands' the depth or bite of the hoes may be regulated by  
" the attendant with the greatest nicety."

[Printed, 4s. No Drawings.]

A.D. 1862, June 17.—No. 1784.

HOLMES, JOSEPH ELLICOTT.—(*A communication from Benjamin Field.*)—(*Provisional protection only.*)—"Machinery for digging  
" or cultivating land."

Spades are fixed to blocks mounted on wheels which are fitted on "a cranked part of the axletree of the running wheel  
" or wheels." "To the peripheries of these latter are secured  
" straight bars which extend across the machine, and act as  
" scrapers for the spades." The shaft carrying the spades is rotated by gearing from an engine. To prevent the spades from acting on the ground, "the cranked part of the  
" axletree is moved round part of a revolution, and the spade  
" wheels will thus be lifted up." This is done by throwing a  
" dog or trip lever" into gear with one of the wheels of the gearing.

[Printed, 4s. No Drawings.]

A.D. 1862, June 17—No. 1793.

VARLEY, SAMUEL.—(*Provisional protection only*)—"Reaping  
" machines."

1. There is a "stationary cutter which has A-shaped or  
" angular projections forming a series of apices standing  
" forward to the crop to be cut." There is a "double edged  
" lever cutting blade between each of the apices," and this is pivotted "centrally in the rear of each V at the centre of each  
" fixed cutter." A screw is used to regulate the pressure of the cutters and there is a "bearing point to hold up the rear  
" part of the lever cutters." The cutters are reciprocated by a bar behind.

2. The cut crop is delivered at either side by rakes on endless bands traversing across the platform. The bands pass close along the surface of the platform and return at a higher level. The stems of the rake work in guides.

[Printed, 4s. No Drawings.]

A.D. 1862, June 18.—No. 1799.

WARREN, JOSEPH.—Ploughs.

1. When a screw bolt is used to connect the share to the body of the plough, it is "bent at its forward end," and fitted so as to "pass through the body in a horizontal or nearly horizontal direction, the hole in the share and that in the body being so formed as to admit of this arrangement." The head of the bolt is bevelled on the face to correspond with the upper surface of the share, and the hole through the upper surface of the share is inclined or bevelled in such manner as to admit of the bent end of the bolt being received into the bevelled hole in the share. The mould board is fixed to the fore sheaf or frame of the body by means of a screw bolt, the head of which is sunk into a recess in the fore end of the mould boards; a circular nut fixes the bolt in its place, such circular nut being received into a recess in the frame." "On the land side of the plough a land side plate is applied, the fore end of which is bevelled off so as to enter a bevelled recess in the fore part of the frame so as to produce a level or flush surface, and the plate is retained in position by means of a turn button or buckle."

2. The beam is "in the form of an inverted trough," and of wrought iron, the size and shape of the trough varying at different parts as required.

3. In "compound ploughs" which work both ways without turning, having two shares, &c. in opposite directions, the inventor makes "the two soles in connection with the two mould boards and shares to incline from the points of the shares slightly downwards towards the centre and to fill the space which intervenes between the two bodies with a moveable sole piece which turns on a central axis so that it may be caused to incline in either direction. This moveable sole piece of the sole is alternately caused to become a continuation of the two fixed soles." By preference the handles of the plough are connected in such a way "with the moveable part of the sole plate, that the act of turning over of the handles from one end of the plough to the other may cause the inclination of the intermediate or moveable part of the sole to be reversed in its position." This is effected

by means of two bent rods attached to the sole plate. The handles "rest on one and under the other of the bent upper " ends of the rods," " by which the moveable sole plate will " be reversed in position, when the compound plough comes " to the end of a bout, by the simple turning over of the " handles." The handles are held in position by a suitable catch.

[Printed, 1s. 10d. Drawings.]

A.D. 1862, June 23.—No. 1845.

HASELTINE, GEORGE.—(*A communication from Moses Gilbert Hubbard.*)—"Machinery for mowing and reaping, the driving " gear employed being applicable to machines for other " purposes."

The following are the different points as specified at the conclusion of the description:

1. A "cast lock iron" is used at the corners of a wrought-iron frame.

2. The frame is on two wheels, the pole is bolted to its top.

3. The frame has "three cross sills for the attachment of " the gear and pole."

4. There is a "yielding corner," that is to say, the cutter bar is affixed to a plate hinged to the end of a lever pivotted to the frame, and supported by a spring. The cutter bar can thus be folded up at the side.

5. When required this plate can be secured by a pin, so as to become rigid.

6. A flange on this plate abuts against the end of the pin jointing the cutter bar to its connecting rod, so as to prevent its slipping out.

7. A curved wooden track clearer is used, with a projecting bar behind to turn aside the standing corn or grass.

8. The fingers are of "malleable cast-iron," and "nearly " conical." The knife works in a slit therein, being supported on small pieces of steel, secured to the back of the fingers. The fingers have a "broad base" at the back, where they are secured to the bar, and "the web" "between the fingers is " inclined under, so as to slide over the ground."

9. The cutter bar is mounted so that it will "project a por-

"tion of its width in front of the finger bar," "to give a more inclined shoulder to the web of the finger bar."

10. Thin pieces of metal are introduced between the finger bar and cutter bar, to adjust their distance apart.

11. The gearing is inclosed in a box, to which the driver's seat is attached.

12. The seat is fitted on pivotted arms so that it will swing forward and backward to vary the position of the driver's weight as required.

13. The reel shaft has a universal joint therein.

14. The "outer reel arm or support" is fitted so as to be capable of "yielding laterally, so as to admit of the vertical freedom of the outer end of the reel."

15. The reel thus formed is combined with a hinged platform.

16. The cutting apparatus is in some cases actuated by means of "driving rims" on the driving wheel, which are caused by the action of parallel joints to clip between them a roller on the crank shaft.

17. In "frictional gearing" causing "the resistance of the speeded shaft and driving power to operate together in providing or increasing the pressure of the driving surfaces together."

18. "Arranging the driving surfaces so as to conform to the pitch lines usually observed in constructing bevil and spur gearing."

[Printed, 1s. 10d. Drawing.]

A.D. 1862, June 25.—No. 1862.

CLARK, WILLIAM.—(*A communication from Célestin Peltier junior.*)—Ploughs.

The mould board is "moveable on an axis fixed at any suitable part of the plough frame." "It is inclined in the direction of the furrow, so that when the rotary mould board receives the pressure of the ground thrown up by the ploughshare, it is caused to turn." In the drawing appended to the Specification, the mould board is "represented in the form of a disc or shield turning on an axis."

[Printed, 6d. Drawing.]



A.D. 1862, June 26.—No. 1878.

MARTIN, JULES. — (*Provisional protection only*)—"Reaping" and mowing machines."

Curbs on the driving wheel act on a lever so as to impart motion in one direction to the cutters, the motion in the other direction being effected by springs. In the cutters, the "angle" between the cutting edges and the line of motion of the "machine" is "much more acute than usual." Also the inventor proposes to "restrict the motion of the cutter bar to an extent less than the breadth covered by each cutting edge." "The points of the cutters are further constantly protected by the fingers on the finger bars never passing beyond the limits of the breadth of the fingers."

(Printed, 4d. No Drawings.)

A.D. 1862, June 28. No. 1895.

KING, THOMAS, and KING, JOHN. — (*Provisional protection only*)—"Agricultural machines."

1. An implement is described which is intended to loosen the soil and clear it of weeds. A barrel fitted with spikes is mounted so as to revolve in a suitable frame mounted on bearing wheels from which motion is given to the barrel. By the action of the spikes, the weeds are brought to the surface and left there. The implement is preferably attached to "the rear of a scuffle." To raise the barrel from the ground it is thrown into gear with a winding pulley on the main axle. A similar arrangement may be employed for raising other implements.

2. A "moveable collar or roller" is attached to the tines and coulters of various implements. It is applied to & fixed on the "prong or coulter, and turns on a vertical axis." It "prevents the prong or coulter carrying with it soil or anything which impedes its proper working."

(Printed, 4d. No Drawings.)

A.D. 1862, June 30.—No. 1911.

NEWTON, WILLIAM EDWARD. — (*A communication from John Jordan Eckel*)—"Apparatus for picking or gathering cotton."

The object of the apparatus is to enable the cotton to be gathered without its being handled by the operator. The

apparatus consists of a long metal or wood case open at both ends and having within it endless bands running over rollers. At the front end the belts are close together, and the upper one projects beyond the lower one, so as to form a sort of mouth on the under side of the case. At the back the belts are separated so as to leave a space. The belts are supported by pieces behind them, and scrapers are fitted at the back of the case to clear the cotton from the belts. The belts are set in motion by a winch-handle. The front end of the case is applied to the pod, and the belts by their action remove the cotton and carry it back to the other end of the case where it is discharged.

[Printed, *sd.* Drawing.]

A.D. 1862, July 15.—No. 2028.

LESLIE, ALEXANDER.—“Apparatus for applying steam or other motive power to cultivate the soil.

The power of a steam engine, instead of being employed directly to draw ploughs, &c., is applied by means of an endless rope to rotate a pulley on a wheeled frame, and from this motion is given to the carrying wheels. The rope is guided to this pulley by a swinging frame with small pulleys thereon, which can accommodate itself to the direction of the rope. The propelling wheels are fitted with blades or spikes which enter the soil and give the wheels hold. These blades may be of such form as to serve for cultivating the soil. For steering, these wheels are independent, and can be thrown out of gear. Ploughs, &c. are fitted in a frame attached behind the first-named frame, and this plough frame can be raised and lowered by suitable gearing from the apparatus. A steering wheel is mounted so that it can be propelled while it is turned sideways for steering. This wheel may be operated from the driving gear or by hand. It may have spikes on its rim. The endless rope passes round “self-shifting guide” pulleys which are moved by apparatus similar to that on the main carriage. To lay the furrows all one way two plough frames are used, and these are raised and lowered alternately. Instead of ploughs revolving cultivators or other implements may be used. Sowing apparatus, harrows, clod-crushers, rollers, &c., may all be attached to the carriage. A plan is

given of the method of ploughing to be used. The engine is in one corner of the field. The rope is led along the top of the field, round a fixed anchor pulley, down one side, round another fixed pulley, back to the top, round a travelling pulley, across the field, parallel with the top, to a second travelling pulley, and thence to the engine.

The invention is also applicable to carriages for other than agricultural purposes

[Printed, 1s. 4d. Drawings.]

A.D. 1862, July 15.—No. 2030.

GREEN, JOHN.—Signals for steam ploughs, &c.

A wire is stretched across the field from the engine to the anchor. A frame fixed on the plough or other implement has eyes in it through which the wire runs. A rope is fitted with an eye also running on the wire, and by this the wire can be drawn upon. It may also be moved by a bar or other appliance. The end of the wire is coiled on a drum on the engine, the drum being fitted with a ratchet, to allow it to run in one direction only. Pegs on the drum act on a lever which sounds a bell, whistle, &c. The apparatus on the plough is also fitted with a small semaphore arm which is operated by the mechanism which pulls the wire. Signals from the anchor are made by pulling the line by hand.

[Printed, 5d. Drawing.]

A.D. 1862, July 24.—No. 2106.

CLARKE, JOHN GOFFE.—Scythes

" This invention consists in forming the crew or heel of a  
 " scythe blade with a recess, and in such manner that it may  
 " be fixed by a wedge in a hollow socket which is fixed or  
 " formed by preference on the end of a tube, which is passed  
 " into and fixed in a hole formed at the lower end of the  
 " sheath or handle," instead of turning up the heel in the  
 " usual manner. The socket is formed on the side of a tube  
 " fitted on to the end of the handle, and the end of the heel is  
 " recessed so that it can be passed into the socket and secured by  
 " a wedge. The socket may also be formed to work freely with  
 " an outer socket, so that it may be secured therein by a screw,  
 " to admit of the position of the scythe blade being regulated.

The tube may be continued so as to form the handle, instead of its being attached thereto.

[Printed, 8d. Drawing.]

A.D. 1862, August 7 —No. 2218.

RALPH, ROWLAND WESTBY —“Reaping machines.”

The improvements relate to a delivery apparatus. A cloth is stretched behind the cutters in place of a platform. This cloth is connected in front to a slip of wood immediately behind the cutters, and at back it is wound on a spring roller supported by arms suspended from an overhead frame. These arms are held extended from the frame by an india-rubber spring fixed to a quadrant on their upper ends, and when they are thus extended the cloth is stretched out. When the arms are brought in close to the frame, the cloth is wound on the rollers by the spring as the roller is carried up close to the cutters. The cut crop is thus allowed to fall from the cloth to the ground. The required movement is effected by a stud on the driving wheel catching against one end of a bell crank lever, the other end of which is attached by a cord to the arms supporting the roller. The lever can be moved by hand so as to be clear of the studs, or to be in contact therewith. As soon as the lever slips off the stud, the india-rubber spring acts to extend the arms again. The cloth may also be extended by a cord pulled by hand or wound on a pulley thrown into gear with the driving wheel. Boards may be hinged to the side of the frame to facilitate the fall of the cut crop. The Provisional Specification refers to a method of obtaining a side delivery by means of a swinging platform under the cloth, but no allusion to this appears in the Final

[Printed, 10d. Drawing.]

A.D. 1862, August 18.—No. 2312.

CHAPMAN, GEORGE —(*Provisional protection only*).—“Reaping machines.”

The invention refers to a delivery apparatus. A lever is pivotted to a slide on a vertical standard. The lever “extends upwards above the main pillar, and is then bent at right angles so as to extend over the platform.” A rake is fitted to this lever. The apparatus is actuated by a crank driven from the main shaft. “On the stud or axle carrying the

"crank is a pendent lever, which has a bend formed in it about one-third of its length from the stud." At this part an eye is formed in the overhanging lever, and through this eye the bent part of the lever passes which serves as the connection of the two parts. To the lower end of the pendent lever is fixed a laterally projecting rod which has a link at its outer extremity that encircles the rod carrying the rake." "The pendent lever moves the rake laterally in a horizontal direction to a certain extent which is limited by the position of the bend. After reaching the extent of its traverse in a lateral direction, the bent part of the lever acts as a fulcrum by which the overhanging lever is raised, carrying with it the rake which moves in a curved direction across the platform, and descends on the other side to the point from which it started." The effect of the different movements is to cause the rake to "traverse in an elliptical path" across the platform, sweeping the corn therefrom. It then rises, is carried back, and again descends, when the operation is repeated.

[Printed, 4d. No Drawings.]

A D 1862, August 26—No. 2361.

HARRISON, JOSEPH, and HARRISON, BENJAMIN—"Clod crushers."

Several discs on a shaft carry between them spiked bars fixed across their peripheries and parallel to the central shaft. The bars may have the spikes cast therewith, or made separate and fixed on. The implement thus forms a "spiked skeleton roller or clod crusher." The spikes on adjoining bars alternate. A "picker or spiked bar" with curved teeth, may be "applied to the clod crusher for picking out or removing from betwixt the spikes any clods, stones, weeds," &c. The barrel may be in two or more sections for convenience of turning; it is mounted in any suitable frame, and can have bearing wheels fitted on to it to raise it off the ground for purposes of transport.

[Printed, 4d. Drawing.]

A.D. 1862, September 11.—No. 2401.

BROOMAN, RICHARD ARCHIBALD—(*A communication from Utielre Amable de Gabreac.*)—"Implements for cultivating the soil."

The invention consists of "an implement composed of two main parts: the first, intended to cut out the earth vertically in the form of a rectangular box without any bottom, three of its sides are cutting for the purpose of penetrating, on pressure being applied, into the soil to the depth required. The second main part consists of one or more screws set to bore down into the soil within the space encompassed by the box; on being raised the screws turn over the soil and transfer it into a furrow at the back of the box, the implement advances, the box is inserted into fresh ground, the screws descend and on ascending take up soil and turn it over into the furrow last formed by them, and so on."

The whole is driven by a steam engine mounted on the frame of the implement. "Movable rakes may be fitted above the screws to remove any soil that may stick to them. If the soil to be tilled is very stony, the stones may be collected by employing an implement analogous to that hereinbefore described having the threads of the screws formed of skeleton or openwork. The stones may be collected in heaps or otherwise."

The implement "may be modified by imparting to the screw blades rotary and advancing motions in the soil without ascending and descending motions."

[Printed, 8d. Drawing.]

A.D. 1862, September 13. No. 2531.

HARKES, WILLIAM.—(*Provisional protection only.*)—"Machinery for mowing and reaping."

The following is the whole Provisional Specification:—

"This invention consists, first, in placing the cutters in a line with the axis of the driving wheel, instead of placing them either before or behind, as now customary; this position allows the cutters to follow the inequalities in the ground.

"Secondly, in connecting the shafts for the horse and the seat of the driver to a swivel frame connected to a centre stud in the main frame of the machine, for enabling the machine to be worked alternately to and fro across the field.



"Thirdly, in making the cutters with knife edges at each edge of the blade and in making the guides through which the cutters work to project on both sides of the blade; also in making the outside guide piece to swivel on a centre to provide for the alternate to-and-fro working of the machine. Fourthly, in supporting the cutters in a frame, which frame is acted upon when required by a treadle and lever from both ends of the machine, to enable the driver to raise or lower the cutters at pleasure. When the machine is used for reaping, the platform for the attendant who rakes up the corn is also turned round with the shafts, and the seat for the driver when the direction of motion is reversed "

[Printed, 4d. No Drawings.]

A.D. 1862, September 22.—No. 2589.

CRANSTON, WILLIAM M'INTYRE.—(*Provisional protection only*)  
—"Machinery for reaping and mowing corn."

1. The cut crop is delivered by endless chains carrying rakes or bars. It is preferred to use two endless chains, one running along each side of the platform.

2. India-rubber or other springs, with stops, are fitted for the cutter bar to strike against at each traverse.

[Printed, 4d. No Drawings.]

A.D. 1862, September 25.—No. 2614.

TOLHAUSEN, FREDERICK.—(*A communication from the Marquis Emmanuel de Pongins.*)—"Steam cultivator."

A frame is used, on which various cultivating implements can be mounted. These include a "deep tiller or sub-soil plough," and a "double-forked cultivator tooth." According to the description in the Provisional Specification (which is rather more in detail than that of the Final), the object of the invention is to accomplish with a single implement the three operations of "breaking the soil, dividing the sods, and ploughing the land." For this purpose three sorts of tools are fixed in the same frame as required. The first tool "has the shape of a bent pickaxe, the second has the shape of a double or forked tooth, and the third implement is composed of the common ploughshare." The drawing appears

to show a single frame, with two opposite sets of cultivators, but the description says that there are two frames. The implements are pivotted to the main frame, so that they are brought into action by the draught of the machine, the set not in use trailing on the ground. The carriage is steered by a rod "which acts on the front wheels." The traction rope is supported by round bosses strung thereon. These lie on the ground, and have within them pulleys over which the rope runs. The implement in its traverse gathers up these "carriers" in front of it, and others are dropped in the rear by an attendant

[Printed, 8d. Drawing.]

A.D. 1862, September 29.—No. 2639.

PUDDEFOOT, MICHAEL.—(*Provisional protection only.*)—"Apparatus for tilling land."

The following is the whole Provisional Specification:—

"My improved apparatus for tilling land consists of a truncated cone-like piece, forming the body of the implement, this is mounted on an axis and in a suitable frame, so as to turn in a rolling direction while passing over the ground: the frame is furnished with handles to guide it like an ordinary plough, and a beam or part to apply the tractive force on the cone piece or body, at the large end I apply in radial positions what I term curved coulters or tines, sharp on the one edge and thick on the other edge or back, and on the other end I mount in a similar and radial position a series of what I term shares, being spade-like instruments, which are set at an angle to the axis, and so as in revolving to throw the soil on one side, that is, in the direction of the length of the axis of cone, so as to form a furrow. This implement in rolling over the ground causes the tines or coulters to enter and stir up the soil, while at same time the spades or shares form the furrows: the tines and spades act on different parts of the soil at same time, the tines during the one traverse of the implement loosening and lightening the soil operated on in the subsequent traverse by the spades."

[Printed, 4d. No Drawings.]

A.D. 1862, September 29.—No. 2646.

BUCKNALL, JOSEPH.—Horse hoes.

The running wheels are mounted on a cranked axle, and on this axle is a worm wheel by which "the crank shaft may be turned round in its bearings and by that means be raised or lowered, thereby raising or lowering the entire framework of the implement with the tines and other parts attached to the frame. The tine bar is placed immediately below the cranked axle of the running wheels, and the tine levers are mounted on a round bar or shaft in front of the running wheels, the tine levers being secured thereon by means of tightening screws so that their positions on the round shaft may be altered and adjusted for the purpose of raising, lowering, or regulating the inclination of the points of the tines."

"In order to take the strain off the tine bar, draught bars are adapted to the latter and connected at their opposite ends to the shafts. The front round lever bar is suspended by links from two slotted bearings fixed to the framework of the implement so that the front lever bar and with it the levers and tines may be moved laterally in either direction by means of a hand lever which turns on a centred pin as a fulcrum, its outer end being connected to both the ends of the round front bar of the implement by means of suitable links and screw couplings."

[Printed, 10d. Drawing.]

A.D. 1862, October 6. No. 2659

BEARDS, THOMAS.—"Machinery for cultivating land."

1. A plough frame mounted on four running wheels has pivotted to it at either end a frame in which ploughs, grubbers, or cultivators are mounted. These frames are raised alternately by chains passing over a winding pulley at the centre of the main frame, the same motion serving to raise one frame and lower the other. The hinder and forward pair of wheels alternately become the steering wheels, the pair for the time being in the rear being held fast by a cental wheel, while the forward pair are operated by a screw and steering handle.

2. The implement is worked in the manner described in No. 2187, A.D. 1859. The rope porters are mounted on wheels

running across the line of the rope, so that they may adjust themselves thereto. They have projecting "horns" over the sheave, to guide the rope on to it.

3. The anchor used is formed of a blade running into the ground, and having an arm pivotted thereto. This arm lies flat on the ground, and is prevented from rising by a pall engaging with a ratchet on the upper part of the blade. The headland pulley is on a separate frame and is attached to a hook on the end of the horizontal arm of the anchor. This hook is jointed, and held by a ring, on slipping which the hook opens and the chain holding the pulley is disengaged.

4. A guide pulley is mounted loose on a shaft parallel to the shaft of the driving drum and near thereto. Its use is to guide the rope on to the drum.

5. A grabber intended for use with this implement is figured, it has "a foot shoe or skeleton frames" "which are adapted to "receive a common share."

[Printed, 8d. Drawing.]

A.D. 1862, October 7.—No. 2704.

SMITH, JOSEPH.—(*Provisional protection only*)—"Screw linch pin for carriages and agricultural implements."

The following is the whole Provisional Specification:—

"This invention of an improved screw linch pin for carriages and agricultural implements consists in making an aperture in the linch pin large enough to receive a screw, a hole is then drilled from the end of the arm up to the linch pin, and the screw is then applied and fixed in the aperture of the linch pin; this arrangement preventing the possibility of the linch pin falling out. This contrivance will prevent accidents occurring by the linch pin coming out of its place, and the arm is always kept cool, thus preventing the wheels being fired."

[Printed, 4d. No Drawings.]

A.D. 1862, October 17.—No. 2803.

SUMMERTON, JOHN.—Harrows.

The harrow is formed of pieces with projections above and below. These pieces are formed of three bars radiating from a common centre, each bar having a pair of spikes at its end, one above and one below. These "triangular radial" pieces

are linked together by rings, split or otherwise formed so that they can be placed through eyes on the ends of the arms. A sufficient number of these are linked together and attached to a draught bar. The sides of the harrow may be strengthened by chains fitted along them. The spikes may be made separate and screwed into the "angle pieces," but it is preferred to cast the whole together in chills or otherwise.

[Printed, 10d. Drawing.]

A.D. 1862, October 27.—No. 2888.

WILLIAMS, WILLIAM JAMES.—(*Partly a communication from Harrison Wells*)—"Field rakes for agricultural purposes."

The following is the description given in the Provisional Specification. It appears to agree in all respects with the drawings and explanations thereof given in the Final. The implement consists of "a horizontal shaft, formed of any suitable material but by preference of wood, with suitable teeth, by preference made of wood, passing through it and fixed therein at equal distances from its centre, to which shaft are attached loosely two upright pieces by preference made of wood, in such manner as to permit the said horizontal shaft to revolve. The said upright pieces are fixed to the shafts by which the rake is propelled or moved nearly at right angles, and the said upright pieces are attached by their lower ends to two handles by means of a loose pin, so as to allow them to play or spring inwardly. The upper end of said handles by which the rake is guided and controlled are framed together by cross pieces. To the extreme lower ends of the handles or below the said pins in the upright pieces are fixed perpendicularly, or nearly so, two suitable pieces, by preference of wood, made tapering or slanting on one side, the widest part being at the bottom and resting on a tooth of the rake, the upper or narrow ends of said perpendicular pieces support the shafts in a horizontal position, so that when the rake revolves the back or rear end of said tooth on which the said upright rests strikes the outside or slanting side of the upright which pressing inwardly allows the tooth to pass the upright pieces, when immediately thereafter the said upright pieces spring back, and at once resume their former & proper position of resting on the said tooth, and thus supporting

" the shaft, and at the same time easing off the rake in its  
" tail."

At " the rear side of each perpendicular in which the centre  
" shaft revolves " there is " a metal shoe to sustain the weight  
" of the load."

[Printed, 8d. Drawing.]

A.D. 1862, October 29.—No. 2920.

HEAD, JEREMIAH.—(*Provisional protection only.*)—" Machinery  
" employed when cultivating land by steam power."

1. For carrying on work after dark, signal lamps are provided, there being one for the engine, plough and anchor. There is also a large lamp fitted to the plough, so that its light can be thrown along the guiding furrow, to enable the ploughman to steer his implement.

2. In balance ploughs, the bodies of the ploughs are attached to the main frame by screws or other appliances which enable the ploughs to be set to work independently at different angles.

[Printed, 4d. No Drawings.]

A.D. 1862, November 17.—No. 3090.

LITTLEBOY, CHARLES—" Implements for cultivating land."

The invention consists in affixing to a plough, either hand or steam, an implement which penetrates and breaks up the soil at the bottom of the furrow. The implement may be attached to the rear of the mould board, and may be of various shapes. It may be fitted so as to be adjustable in depth, and this may be regulated by a hand lever.

[Printed, 4d. No Drawings.]

A.D. 1862, November 29.—No. 3201.

CROMPTON, JAMES.—(*Provisional protection only.*)—" Apparatus for ploughing, harrowing, clearing, and drilling land."

A frame carrying a steam engine is mounted on wheels, two of these being steering wheels, " and also a number of rollers  
" when the land is soft "—Ploughs and other implements are mounted on a block working in vertical guides on this frame. The apparatus is moved by driving the wheels from the engine. Harrows are carried by vertical shafts rotated by



the engine, and cutters may be mounted in a similar way "for cutting a space in each side of the trunk of a tree for the purpose of felling it." A crane is also fitted on the frame.  
[Printed, 4d. No Drawings.]

A.D. 1862, December 1. — No. 3216.

IRWIN, JOHN. — "Machine for cultivating land."

A central frame mounted on a pair of bearing wheels carries a vertical shaft on which is a pulley. The traction rope passing round this pulley imparts motion to the bearing wheels and also to a set of knives mounted on a horizontal frame at the bottom of the shaft. Before and behind this are cross bars, carrying coulters and "shell-boards." There is also a frame carrying a steering wheel mounted at each end of the main frame. These frames can be raised by chains over winding drums. The coulters, &c. are raised and lowered by screws, or they may be mounted on the moveable frames. The coulters which are in front for the time being cut furrows in the land, and the revolving blades work across these furrows. The other set of coulters, &c. are raised up out of action. The implement may be used for clearing the ground from weeds or for digging in manure. In the latter case "the coulters are dispensed with, and a row of double shares or 'shell boards' employed, so as to throw the ground into a 'stitch,' the manure falling into the furrows and being covered over by the action of the revolving tines." It is stated that the implement may be drawn by horses, but no method of thus working it is described.

[Printed, 10d. Drawing.]

A.D. 1862, December 11. — No. 3318.

SPIGHT, ISAAC. — Horse hoes.

Improvements on No. 786, A.D. 1859.

In the former invention the hoes were attached to levers connected with "a revolving shaft, working in a shoe frame having bearings at each end, and which shaft could be raised or lowered as required for different kinds of corn or roots." The present improvements consist in "suspending the shaft or bar to which the hoes are attached upon a bearing at its centre," so that as one end is raised the other is lowered.

[Printed, 2d. Drawing.]

A.D. 1862, December 11.—No. 3325.

## GOULDING, WILLIAM.—“Ploughs.”

The land side of the body, instead of being upright, or nearly so, “is formed in such a manner as to incline from the sole over towards the furrow side,” while the beam “comes more over towards the furrow side edge of the sole.” The front part of the share is connected by a rod to a projection on the frame, and this can be tightened up by a screw nut. The hind part of the mould board is also secured to the same projection. “The sole and slipe are cast together,” and “this piece is connected to the body or frame by two bolts,” one of which is an eccentric bearing against a projection, “so that by turning this eccentric round (when the nuts are slack) the inclination of the sole can be varied.” A piece forming a “continuation of the slipe” is bolted to the body.

Besides the above, the following improvements are mentioned in the Provisional Specification, but do not appear to be noticed in the Final.—The beam is straight, and when of metal it is by preference tubular. “The iron or steel handles are, when they join the hollow beam, bent into a similar curvature to that of the beam, and at the outer ends of the metal parts of the handles the wood handles are fixed by means of two screw bolts and nuts to each handle, by which a wood handle may be readily removed and another fixed in its place.” “The coulter is set to a similar incline from the beam to that of the land side of the body.” It “is fixed and adjusted in a socket which is capable of being rotated on an axis by a curved projection and cam.” This socket is adjustable “to set the point of the coulter up or down,” also “to and from the beam,” by a wedge. A transverse sliding bar carries a sliding upright for the furrow wheel. The land wheel is carried by an upright sliding through a projection on the beam. “In constructing wheels for ploughs, the nave is made of a cast plate with a flange all round at one side, there is also a hole in the middle for the passage of a hollow cast box, which has a collar or flange, which fits into the recess in the nave, and is fixed by screws and nuts in the hollow nave. The axle is preferred to be cast and hollow, and to have a screw bolt through it in order to its being fixed by a nut.” For a

wheel scraper "a plate is used on a stem, so that when one part is worn another part may be brought into position."

[Printed, 10d. Drawing.]

A.D. 1862, December 17.—No. 3376.

LATTER, LEONARD.—Ploughs.

The plough is "double-ended" so that it does not require to be turned at the end of the bout. It is to be drawn by horses. "The operating parts of the plough, as the coulter, share and mould plate, are formed in duplicate and pointing "in opposite directions." The hinder part of each mould board is removed, and in place thereof there is "a bar or plate "capable of turning near one of its ends on an axis of motion, "and of being held in the required position to serve as a "continuation of either mould plate to effect the complete "turning over of the furrow slice." At the outer end of this bar are "cutters or seam pressers to cut or pare off a portion "of the furrow slice, and allow it to fall into the furrow to "receive the seed." "The mould plates from this junction "with their shares, rise quickly from near a horizontal to a "vertical line, or nearly so." "The sole plate and other of "each set of the operating parts" "incline upwards from the "centre of the sole plate." The beam is similar at both ends, and has two pairs of wheels one of which is always out of action. The draught is "from the centre of the length of the "combined plough, by means of a lever or bar, which is "capable of turning on such centre for the action of either "set of working parts, and of being set as desired," one end of this bar being formed with handles, and the other for the attachment of the horses. The bar is held in the required position by catches.

[Printed, 1s. 3d. Drawings.]

A.D. 1862, December 17.—No. 3377.

WHEELER, ROBERT.—(*Provisional protection only.*)—Ploughs

The following is the whole Provisional Specification—

"This invention has for its object 'Improvements in "ploughs.' In ploughs as at present constructed it is usual "to employ a coulter or knife to make a vertical cut in the "land, and then the share following makes a horizontal cut,

“ connecting the bottom of the vertical cut of the coulter  
“ with the work already done, thus a slice is divided off which  
“ the mould board turns over. According to my invention,  
“ in place of a single coulter I employ two or more coulters  
“ producing as many separate slices, then the share follows,  
“ and the mould board turns over all the slices at once, thus  
“ the land becomes more thoroughly divided and the air is  
“ better able to penetrate it. I also according to my invention  
“ attach to a plough having a coulter or coulters, share, and  
“ mould board, a mole or subsoil tine for stirring the land  
“ below the sole of the plough at the same time that ordinary  
“ surface ploughing is effected.”

[Printed, 4d. No Drawings.]

A.D. 1862, December 27.—No. 3456.

SAMSON, WILLIAM HENRY.—(*Provisional protection only*)—

“ Machinery for cultivating land by steam power.”

“ The following is the whole Provisional Specification :—

“ This invention consists firstly in constructing the apparatus  
“ used for ploughing as follows :—The plough frame carries  
“ three ploughs side by side, but little in advance of the  
“ other; these ploughs can be turned so as to be a right or  
“ left handed plough, similar to a Kentish plough; also the  
“ position of the ploughs can be changed, for instance, the  
“ first plough in advance can be drawn behind, the hindermost  
“ plough drawn to the front, the centre one keeping its  
“ position.

“ Secondly, two traction engines are used when ploughing,  
“ one at each side of the field and opposite to each other, and  
“ attached to each engine is an inclined plane, upon which  
“ the plough mounts as it arrives at either side and thus  
“ withdraws itself from the soil. When entirely clear from  
“ the soil the engine is moved forward, the width of the  
“ ploughs carrying with it the inclined frame and ploughs.  
“ The ploughs are then turned round on the inclined plane,  
“ either by means of a turntable constructed thereon or it is  
“ first lifted by a small crane, and turned by hand. The  
“ position of the mould boards is then changed from right to  
“ left or vice versa, as the case may be, and the first plough  
“ pushed backwards and the last one forwards, the middle  
“ one returning its position as before described. The plough

" is then ready to recross the field, when the same operation is repeated.

" Thirdly, in order to economize steam power as much as possible, I couple the two engines together by means of a chain or rope, which passes round a pulley fixed to and driven by the engine from one to the other across the field so that when one engine is not drawing the plough it may through the means of the chain assist the other."

[Printed, &c. No. Drawings.]

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### 1863.

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A.D. 1863, January 2.—No. 21.

RANSOME, ROBERT CHARLES.—(*A communication from Stanislaus Lalop.*)—"Reaping machines."

" In order to deliver the cut crop at the side of the machine in quantities suitable to be tied up into bundles, a single rake is used which is mounted at the end of an arm which moves on a suitable axis. The lower ends of the rake teeth, when delivering the cut crop, come close to and are moved over the platform of the machine. The arm with its rake performs or reciprocates to and fro in the segment of a circle of about 90°. The platform of the machine is formed of a segment of a circle, the cut crop is received on to the front end of the platform where the cutters are situated, and the cut crop is delivered at the other end of the platform which comes to the side of the machine. The outer edges of the platform are raised. The arm of the rake receives its reciprocating motion primarily from the rotatory motion of the running wheel or wheels, from which the cutters also derive their motion in an ordinary manner. The rake in its return stroke, after delivering a quantity of the cut crop, is, as before stated, caused to rise and pass back over the platform, so that the teeth are well above the platform and also above the further quantity of the cut crop thereon. The requisite motions to the arm of the rake are by preference imparted to it by means of a crank pin or eccentric or suitable cam which gives motion to a connecting rod, which

" at its other end moves on a rocking lever or links. The  
 " connecting rod, by a lever mounted on an axis carried by  
 " the connecting rod, gives motion to the axis of the arm of  
 " the rake and causes it to move in the arc of a circle, for  
 " which purpose one end of such axis of the arm is arranged  
 " to move or turn about an axis, whilst the arm of the rake is  
 " also made to perform a partial rotation by the outer end of  
 " the lever (the axis of which is carried by the connecting  
 " rod) being connected or attached to an arm or projection at  
 " the other end of the axis of the arm."

[Printed, 1s. 4d. Drawings.]

A.D. 1863, January 9.—No. 78.

PARSONS, DAVID BALL.—(*Partly a communication from Walter Abbott Wood.*)—(*Provisional protection only.*)—"Reaping and  
 " mowing machines."

1. The frame is mounted so that it may pivot on the axle  
 of the bearing wheels "independently of the pole which is  
 " attached to the same axle." The cutter bar "is jointed to  
 " the front of the frame on one side, and a lever is combined  
 " with the frame in such a manner that by means of it the  
 " cutter bar may both be lifted a short distance without  
 " changing its horizontal position," and "may also be turned  
 " up into a vertical or nearly vertical position." The lever  
 has connected to it a chain which is passed over a pulley on  
 the pole and attached at its other end to the frame. The  
 motion of the lever thus raises the frame. "When the lever  
 " is still further depressed, it comes against a stud projecting  
 " up from the frame and pushes it down." This depresses  
 one end of the cutter bar and elevates the other end. Also  
 the lever may operate a crank with a crank pin working in a  
 slot in the connecting rod attached to the cutter bar. A slight  
 movement raises the cutter vertically, the pin moving in the  
 slot. A greater movement brings the pin against the end of  
 the slot and raises the cutter entirely.

2. The cutters may also be raised and lowered by means of a  
 piece connecting the frame and pole, which can be lengthened  
 or shortened.

3. The axle of each bearing wheel may work in an adjustable  
 plate on the frame by which the frame can be raised or  
 lowered.



4. To discharge the cut crop, a rake is employed which is "attached to and actuated by an endless travelling band running round the sides" of the platform. This rake "consists of a stem with teeth at one end, and with a flat board attached to it immediately behind the teeth, and so as to stand vertically to the surface of the platform. This stem is jointed at about the middle, and its further end is hinged at the back of the platform and at one side thereof. The discharge of the crop takes place at the corner where the rake is jointed, and from the arrangement described it results that the cut crop, having been collected up against a board fixed at the side of the platform by the passage of the rake across the front of the platform, is then "by the teeth of the rake drawn directly backwards" and the bundle is grasped between the board on the rake stem and the "side board," so that it is delivered "in a much more compact form than formerly."

5. A platform may be hinged to the back of the cutter bar, and supported by a wheel, &c, at the back. This platform may be composed of parallel bars, so that the stubble projecting through from below clears off the cut crop. To aid this effect a "pressing bar" may be forced down on the cut crop by means of a treadle.

6. To prevent the cutters clogging, the knives are made long enough "to cut up to the points of the fingers." The fingers are "made in two pieces, an upper and a lower." The "guides for the cutter bar are formed entirely by the lower parts of the fingers," "while the upper parts, in order to avoid clogging, are kept at a distance from the cutter bar, except just at the points of the knives."

7. A "moveable tyre" is used which can be slipped over the rims of the bearing wheels to prevent the studs thereon jolting over hard roads.

[Printed, &c. No Drawings.]

A.D. 1863, January 9.—No. 83.

TASKER, WILLIAM, the younger.—Harrows.

"It is proposed to employ separate truss bars between the several longitudinal beams of the harrow frame, and to connect such truss bars to the beams in such positions as will afford the greatest strength, by preference at right

" angles to the beams, which when made zig-zag gives a " diagonal trussing." The truss bars may pass through the beams and be keyed thereto, or they may have a turned up foot at one or both ends, and be secured by a bolt passing through both feet of two contiguous bars and the beam, or by the end of a bar passing through the beam and through the foot of the contiguous bar.

[Printed, 8d. Drawing.]

A.D. 1863, January 15.—No 127

**TURNER, HENRY** —(*Provisional protection only*)—" Apparatus " for preventing and curing blight, decay, disease and rot in " potatoes."

Covers are formed of fabric stretched over wooden framings, and a current of air is produced by connecting one end of the cover with a chimney in which is a lamp or other heating apparatus. These covers are placed over the plants when required.

[Printed, 8d. No Drawing.]

A.D. 1863, January 28.—No. 260.

**CRITCHLEY, HENRY**.—(*A communication from Robert Bodington.*)—" Reaping and mowing machines."

The bearing wheel consists only of a hollow ring, with flanges on its internal periphery. Three small pinions work within this ring, being retained by the flanges. One of these pinions drives the cutter, a second the delivery apparatus and reel, and the third serves to hold the ring in its place. The pinions are carried by a cast-iron bracket, which also supports the whole frame of the machine. " The top of the bracket is " arranged to carry two uprights; the first is a piston carry- " ing a pulley and pinion, the other upright forms part of the " frame for carrying the machinery for the fly and delivery " rake. This frame is made to oscillate. Through this frame " runs a tubular shaft, having keyed upon it a wheel, which " wheel runs into the pinion above named, which being " stationary causes the wheel not only to revolve, but to give " an oscillating motion to the frame equal to the protuberance " on the wheel. The wheels are kept in gear by the spindle " of the pinion running in a groove. On the inner end of the

" tubular shaft is keyed a sort of face plate; this plate has  
 " cast upon it places to receive the bent pieces of timber to  
 " form the fly, these are held in their position by thumb-  
 " screws." " On this plate is also bolted a piece of timber  
 " for carrying the shaft of the rake. The rake is made fast to  
 " this shaft, but by means of a set pin it can be easily raised  
 " or lowered. On this shaft is fixed a short lever connected  
 " with another lever running across the face plate. Attached  
 " to this lever is a rod running through the hollow shaft, on  
 " the end of which is an universal joint. This is again con-  
 " nected with a bell crank connected to a rod, this being held  
 " at its end, it follows that as the frame oscillates the rake  
 " sweeps the platform, gradually acquiring an angle of about  
 " 90 degrees. The rake having cleared the board is brought to  
 " its former position again by the forward oscillation of the  
 " frame."

[Printed, 10d. Drawing.]

A.D. 1863, January 30—No. 277.

BRANFORD, JOHN WILLIAM.—(*Provisional protection only*)—  
 Horse hoes.

The following is the whole Provisional Specification :—

" An implement with two travelling wheels to be drawn by  
 " one horse having a bar affixed to the frame, upon which are  
 " placed four hoes for cutting the ground longitudinally, an  
 " iron shaft with two driving wheels turning two pinions with  
 " shafts, to which are attached two iron plates with four  
 " knives or hoes on each for cutting or setting out the plants,  
 " working in a transverse direction; levers for striking the  
 " gear, and lifting the hoes out of work; and also the travel-  
 " ling wheels and a pair of shafts to which the horse is har-  
 " nessed for drawing the implement."

[Printed, 4d. No Drawings.]

A.D. 1863, February 9.—No. 359.

SMITH, HENRY and SMITH, JOHN.—(*Provisional protection only*)—" Drills or machines for depositing seed and manure."

The following is the whole Provisional Specification. —

" Our invention of improvements in drills or machines for  
 " depositing seed and manure has for its object to arrange and

" construct the several parts of the machine in such a manner  
 " that the tins or funnels for conveying the seed or manure  
 " down to the coulters may hang straight down and be less  
 " liable to become deranged or put out of order than hereto-  
 " fore. To this end we propose to employ two sets of hoppers,  
 " and to divide the coulters into two sets, one of which is  
 " placed behind the axle as heretofore, and the other set  
 " before the axle. By this means the coulters with their tines  
 " and chains are kept more distant from each other, and  
 " there is less liability of their interfering with each others'  
 " working. This arrangement of the coulters also very con-  
 " siderably lightens the draught of the machine, and enables  
 " the operator to pass over land in almost any state of rough-  
 " ness, as there will be abundance of room for clods, unburned  
 " manure and other impeding obstacles on the ground to pass  
 " between the coulters. Another improvement consists in  
 " raising the coulters by means of an arrangement of  
 " parallel levers which will lift the bars up in a straight line  
 " instead of in a curve. By this means any arrangement of  
 " the tins when passing over uneven surfaces will be effectually  
 " prevented, and the two sets of coulters will always remain  
 " an equal distance from each other and also from the  
 " ground.

" Another improvement relates to a novel kind of press  
 " which when applied to our improved drill will have the  
 " effect of relieving the shaft horse from a very considerable  
 " amount of the weight which is thrown on his back by using  
 " the ordinary press drill. The improved press consists of a  
 " toothed rack attached to the axletree with a ratchet, a rod  
 " from which passes to the handles at the back of the drill,  
 " and is so placed that the press can be most easily and  
 " instantly applied."

[Printed, 4d. No Drawings.]

A.D. 1863, February 17.—No. 427.

LEE, JESSE.—(*Provisional protection only.*)—"Ploughs and  
" harrows."

The following is the whole Provisional Specification:—

" The invention consists in forming the handles and beams  
 " of ploughs of wrought iron gas tubing or piping, such as is  
 " at present commonly used by gasfitters, the object being to

" lessen the weight of ploughs without lessening the strength  
 " and durability thereof.

" And as regards harrows, this invention consists in forming  
 " same of gas tubing arranged in four or more separate squares,  
 " each connected at the centres of their inner sides by links,  
 " and in imparting to said squares a side movement."

[Printed, 4s. No Drawings.]

A.D. 1863, February 21 —No. 476

DODWELL, ROBERT VALENTINE —(*Provisional protection only*)  
 —" Preventing the destruction of plants by insects."

The following is the whole Provisional Specification:—

" The invention is designed for the purpose of guarding or  
 " protecting plants from injury by ants and other wingless  
 " insects, or by snails, caterpillars, worms, or other similar  
 " animals, and the improvement consists in the novel appli-  
 " cation, adaptation, or employment of galvanic or electrical  
 " influence or agency to the purpose. The plants to be pro-  
 " tected are to be surrounded by a galvanic arrangement of  
 " metals, either each plant separately, if large, or if the plants  
 " are small the bed containing them is to be surrounded, say,  
 " for instance, with an edging or border of zinc, having a  
 " band of copper soldered or attached upon its surface, whereby  
 " a galvanic action is set up, and which will be found to  
 " effectually prevent the passage of insects or animals, for  
 " though the action may be but slight it excites in a sufficient  
 " degree to prevent them crossing it. I would remark that  
 " galvanic combinations of other metals may be employed."

[Printed, 4d. No Drawings.]

A.D. 1863, February 26.—No. 545.

PUDDEFOOT, MICHAEL —(*Provisional protection only*).—" Im-  
 " plements for tilling and cultivating land."

A "truncated cone-like piece" is mounted on a frame like  
 that of a plough and similarly drawn. "Curved coulters"  
 and "spade-like instruments" are mounted on the cone,  
 which is free to revolve as it is drawn over the land. The  
 body may also be formed "in portions of cylindrical form  
 " being large at one end and small at the other." Clearing  
 teeth are fitted to clear the coulters, &c. A drill may be

mounted behind this implement. Bearing wheels may be used so that the depth at which the implement works may be varied.

[Printed, 4d. No Drawings.]

A.D. 1863, March 2.—No. 580.

PAGNY, Aimé François. — "Agricultural implements for cultivating tubercles, roots, and all oil plants."

The following is the whole Provisional Specification. The Final is almost identical therewith, with the addition of references to the drawings.

"The agricultural implement forming the subject of my invention is a ridge or bouting and at the same time a roller plough. It is composed of a ploughshare with double mould boards (smaller than for ordinary bouting ploughs) and of four conical rollers acting in the inclined plane of the ridges. The share, the main object of which is not the ridging, breaks the subsoil, cleans the water furrows, and thus prepares the work of the rollers, which follow it. The two first, placed on each side the mould boards, simply dress the earth, and the two latter, on the contrary, which are more open, more inclined, and placed higher, press or settle down the earth and close the ridge. Four iron rods serve for axles and receive the four conical rollers reversed, with their heads downwards. These rods slide freely at their upper part in two cross pieces, which may be compared to the branches of a compass. The head of this compass is about twelve inches apart behind the share, and the two branches, about twenty-eight inches long, play at their ends on a cross piece. A screw permits the opening to be adjusted at from sixteen to twenty-four inches, according to the greater or lesser pressure required. The inclination of the rollers is only two by two, because the fixing point at the base is the same and the spreading apart of the points of the compass is more or less developed. Lastly, a wheel, about eight inches in diameter, placed at the end of the beam, relieves the arms of the labourer, keeps the two last rollers at an elevation of say, four inches, in order that they may more easily close the ridge."

[Printed, 8d. Drawings.]



A.D. 1863, March 3.—No. 598.

PARSONS, DAVID BAIL.—(*Partly in communication from Walter Abbott Wood*)—"Reaping and mowing machines."

The frame "is mounted on the axle of the carrying wheels, " so as to be able to pivot thereon independently of the pole, " which is attached to the same axle." "The cutter bar is " jointed to the front of the frame on one side," and a lever " jointed to the frame has attached to it a chain which passes over a pulley on the pole and is fixed to the frame. By moving the lever the end of the frame with the cutter bar is raised. " When the lever is farther depressed it comes against a stud " projecting up through the frame and pushes it down, and " the lower end of this comes against a projection from the " cutter bar beyond its centre, causes it to tilt up." Or " a " piece may be jointed to the inner end of the cutter bar so " as to project beyond its centre, the further end of this piece " being connected with the pole by a link; then when the " cutter bar is tilted by the lever," " the jointed piece turns " about its centre " " until the cutter bar has moved horizon- " tally for a sufficient distance, and then a shoulder on the " jointed piece comes against a projection on the cutter bar " and renders the joint stiff " so that the bar " is compelled " to turn with the piece jointed to it, and thus it is tilted up." Or by suitable gearing the lever may actuate a crank shaft with a crank pin working in a slot in the connecting rod which drives the cutters.

The slot allows a certain motion of the rod, but " when the " lever is moved through a considerable angle, the rotation of " the crank brings its pin to the end of the slot " " and then " any further movement of the lever acts to tilt up the cutter " bar."

" When the cutter bar is not arranged to be raised and " lowered horizontally whilst at work by pivoting the frame " on the axle," " similar means may be employed for adjusting " the height of the cutters and cutting apparatus; the pole " which as before is fixed to the axle, is connected in rear " thereof, the frame which rocks on the axle as before is " connected at its rear end by a suitable adjusting link or " piece with the continuation of the pole, and according as

" the length of this connection is increased or decreased, the  
" cutter bar will be raised or lowered "

The axle of one of the wheels has its bearings in a plate which can be adjusted in its position on the frame by screws working through a slot in the plate.

The delivery apparatus consists of " a rake attached to and  
" actuated by an endless travelling band " running round the  
sides of the platform. " The rake consists of a stem with teeth  
" at one end and with a flat board attached to it immediately  
" behind the teeth, and so as to stand vertically to the surface  
" of the platform ; this stem is jointed at about the middle,  
" and its further end is hinged at the back of the platform,  
" and on the side thereof at which the grain is discharged."  
The cut crop " having been collected up against a board  
" fixed at the side of the platform " by the rake, is " nipped  
" together " between the board on the rake and the " side  
" board " so as to be delivered in a bundle.

The platform may consist of parallel bars trailing on the ground. The stubble projecting up between the bars clears away the cut crop therefrom. A bar is arranged to catch and hold the crop off the platform. This is actuated at intervals by a treadle to allow the crop to fall on the platform.

To prevent clogging, the knives are made sufficiently long  
" to cut up to the points of the fingers," " these being for the  
" purpose made in two parts, an upper and a lower " " The  
" guides for the cutter bar are formed entirely by the lower  
" parts of the fingers " The upper parts " are kept at a  
" distance from the cutter bar, except just at the points of the  
" knives when they are required to support the crop "

A " moveable tyre " is used to slip over the bearing wheels when they have projecting studs upon them, for purposes of transport.

The bearings for the axle of the main driving wheel are in some cases " carried by brackets which at their forward ends  
" are capable of turning around an axis carried by bearings on  
" the frame." " This axis is the axis of the pinion which re-  
" ceives motion from the toothed wheel which is fast on the axle  
" of the driving wheel." The wheels are thus always in gear.  
A bolt on the frame passes through slots in the brackets, so that the frame can be clamped at any height. The other side of the platform is carried by a wheel mounted in a similar

bracket. A wheel is mounted on a "short plank" jointed to the front of the frame. The height of the frame and cutters can be adjusted by means of this wheel.

[Printed, 2s. 2d. Drawings.]

A.D. 1863, March 5.—No. 630.

CLAY, CHARLES. — (*Provisional protection only*) — Chain harrows.

The following is the whole Provisional Specification:—

" This invention has for its object improvements in chain harrows. In constructing chain harrows according to this invention each row of links which passes transversely across the harrow is composed of alternate links of cast iron or malleable cast iron, cast to the form required, and of wrought-iron links which connect together the links of malleable cast iron, the cast links are made with holes, by preference oval shaped holes, through them, on two opposite sides of the link, thus" [here is a small figure], "and the wrought-iron links pass through these holes, the wrought-iron links are, by preference, formed with notches on their opposite sides, into which notches the cast links fit. The wrought-iron links will thus always keep the cast-iron links at the proper distance apart, so that each row of links will be kept properly extended. The rows of links are connected together by the wrought-iron links of each row being connected to the wrought-iron links of the next row, either by plain links of wrought iron, or by links formed with holes through them on two opposite sides, as above described. Each of the cast-iron links is made, by preference, of the form above shewn, each link having two projecting spikes or teeth upon it, but this may be varied, the material of which the links are made may also be varied. The chain harrow is connected to its whipple-tree by rods or chains passing from the whipple-tree to the wrought-iron links of the front row of links of the harrow."

[Printed, 4d. No Drawings.]

A.D. 1863, March 13.—No. 688.

SMITH, WILLIAM. — "Machinery for cultivating land and sowing seed."

The implement is intended to be worked by steam power. A triangular fore-carriage is mounted on a pair of bearing wheels at its rear, and a pair of steering wheels, with suitable handle, in front. The "draft instrument or apparatus" to which the traction rope is attached, is similar to that described in No. 87, A.D. 1856, and enables the implement to be turned by the drag of the return rope. The "tines, pressers, and "seed tubes," are arranged as in No. 1219, A.D. 1861. These are mounted in a lever frame, pin-jointed to the rear of the front frame. The fore part of the fore-carriage can be raised by lever handles affixed thereto and extending backwards. The seed box is mounted on the fore-carriage, and the seed is raised from it to a smaller box immediately over the coulters by means of endless chains carrying cups. From this second box it passes to the seed tubes. The pulleys carrying the chains can run loose on their shaft, or be clutched thereto, so that any part required of the box may be supplied with seed. The hind frame is mounted on a pair of wheels, and is adjustable as to height thereon. It can also be raised clear of the ground by any suitable mechanism.

Instead of the above arrangement, there may be only a single seed box, over the coulters, and the frame carrying the tilling implements is then jointed to the fore carriage at a point in front of the main bearing wheels. The object of this is to cause the whole carriage to balance, in spite of the absence of the front seed box.

In the implements "known as Fowler's tilling implements" in which "two sets of cultivating tines are applied in each implement, one set at each end of a lever frame, supported and turning on a central axle as a fulcrum, which is supported by a pair of wheels having a suitable steering or locking motion," there are "in combination with the cultivating tines, pressers, seed tubes and seed box at each end of the lever frame." Motion is given to the shafts of the seed boxes from any of the wheels."

Reference is made to No. 710, A.D. 1858.

[Printed, 2s. 2d. Drawings.]

A.D. 1863, March 14.—No. 689.

GEDGE, WILLIAM EDWARD. — (*A communication from Jean Germain Felix Olumageran.*) — (*Provisional protection only.*) — Plough.

The following is the whole Provisional Specification :--

" This plough is composed of a beam or body similar by its  
 " share, coulter, mould board, handle, and oblique axle to the  
 " ploughs usually used in vineyards, but differing from them  
 " in the tie piece and a vertical shaft turning in sockets, one  
 " of which is on the heel. The upper part of this shaft receives  
 " the moveable handle, and the shaft further carries the small  
 " plough beam, which is composed of a concave mould board,  
 " a coulter and share. If the ploughman acts upon the move-  
 " able handle, the small plough beam will describe a greater  
 " or lesser angle, and if, on the contrary, he brings it against  
 " the fixed handle, the small beam will come into line, and be  
 " lodged between the mould board of the main beam and its  
 " fore part. The obliquity of this movement is regulated by  
 " a double segment of a circle placed on the tie piece, and  
 " pierced with holes into which passes an iron pin for arrest-  
 " ing the moveable handle. This plough, by means of a move-  
 " able frame fitting on the axle, lends itself to every description  
 " of ploughing in lines or furrows, whether one horse (or other  
 " animal) be on the left of a row of vines or other plants, and  
 " the other horse on the right, or whether both be on the same  
 " side, and this plough by changing the form of the instru-  
 " ments, will work between two rows of all plants cultivated  
 " in ridges or lines "

[Printed, 4d. No Drawings.]

A.D. 1863, March 20.—No. 751.

BRIGHAM, JOHN, and BICKERTON, RICHARD.—" Reaping  
 " or mowing machines."

The frame of the machine is cast in one piece. The main  
 driving wheel is outside the frame. " A bracket piece is  
 " affixed to the framing of the machine, and from the upper  
 " part of this bracket piece extends an open frame of a seg-  
 " mental figure. There is an opening between the segmental  
 " plates of this frame to admit of the motion of the hand  
 " lever, by means of which the cutter bar is raised or lowered. "  
 This lever is keyed to a shaft on which is a " a segmental  
 " pulley " with a chain thereon, the other end of the chain  
 being connected to the cutter bar. A spring on the lever takes  
 into a ratchet on the segmental frame, and holds the lever in

any required position. The arrangement of the lever, &c. may be modified to suit different constructions of machines.

[Printed, *sd.* Drawing.]

A.D. 1863, March 21.—No. 754.

ROBERTS, FREDERICK, and ROBERTS, ALEXANDER.—“Improvements in agricultural implements, and in apparatus for working the same.”

1. The plough frame is mounted on three bearing wheels, one furrow wheel and two land wheels. The traction rope is wound over a drum running loose on a transverse shaft, and capable of being clutched therewith. This shaft is fitted at the central part of the frame; it has on it discs connected to the ends of the implement frame. The draught of the rope is thus caused to raise one set of ploughs, and bring the other into action. The three bearing wheels are connected together and mounted so that they can be used for steering.

2. Some improvements are described in the engine and winding drums.

3. The anchor is mounted on three wheels, one in front and two at the sides. These latter have plates to hold in the ground. The pulley can be thrown into gear with a spur-wheel on the axle of the hinder pair of wheels, so as to move the anchor forward when required. The front wheel is mounted as a steering wheel, and is actuated by a hand lever.

4. Instead of operating by a traction rope, the engine may be caused to traverse the ground, drawing the implement behind it.

[Printed, *2s.* Drawings.]

A.D. 1863, March 23.—No. 767.

CLARK, WILLIAM.—(*A communication from Jean Baptiste Décours, Athanasio Charles Le Lavandier, and Pierre Edouard Lombert.*)—“Agricultural apparatus.”

The implement described forms a “combination in one” framing of all the implements required in agriculture. It consists of a framing with a number of sockets in which the implements required are to be set. They consist for the most



part of coulter of various shapes. There is also a share and an instrument which in the drawing has the appearance of a rotary cutting wheel, but which is not described. This is to be used for trenching land. The frame of the apparatus has a pair of bearing wheels, also a fore-carriage and steering apparatus. By means of a lever the height of the frame can be adjusted.

[Printed, 8d. Drawing.]

A.D. 1863, March 27.—No. 807.

KING, JOHN, and MARSHALL, THOMAS HENRY.—“Apparatus for preparing land for seed and for harrowing land.”

1. A dibbling apparatus is described. A pair of wheels are mounted on an axle, so as to be adjustable along it. Dibbles are fitted on the periphery of these wheels, so that they can be adjusted to any distances apart, and so that they can rotate, each on its own axis. Projecting rods on the ends of the axle trace lines on the ground to guide the implement on its next bout. The frame is fitted with steering handles, and pivots on a central vertical support. On its upper side a pair of bearing wheels are mounted, so that the implement can be turned over to run thereon for purposes of transport. A dibble wheel of this character may be combined with a plough “in such manner that the dibbles may run along the ridge or portion turned over by the plough, and prepare the same for receiving seed.”

2. A harrow is formed of “numerous similar parts,” to each of which a tine is fitted. Each part is “to be connected to the similar parts in such manner that when pressed together they form what may be said to be a rigid bar;” “when the harrow is on the land, and the teeth penetrating it, the several parts will be drawn out,” and the bar thus becomes flexible. “For this purpose the ends of the parts are connected by pin joints, and one end of each piece is made with a slot through it through which the connecting pin passes, and the ends of these pieces are formed to lock into each other when pressed together. At the angles the pieces are formed in the shape of right angle bends.”

[Printed, 1s. Drawings.]

A.D. 1863, March 28.—No. 810.

SIMS, REUBEN.—(*Provisional protection only.*)—"Reaping and mowing machines."

1. The connecting rod imparting motion to the knife is mounted so that its weight is taken off the crank pin. The inventor says:—"In the aforesaid connecting rod, and at right angles to it laterally, I attach or form a slot for the reception of the crank pin which gives motion to the knife bar. The slot is of any convenient length to admit of the throw of the crank and of any convenient width to admit of a crank pin with or without a bowl or friction wheel or bush upon it," and to allow the same free motion in the slot. The rod will then "advance and recede laterally without partaking of the rotatory action or the rise and fall of the crank pin.

2. The finger bar is attached to the frame by a bar hinged at its connection with the frame and with the bar. It is also supported by a hinged stay. The object of these arrangements is to allow the bar to rise and fall on irregular ground.

3. The "knife crank spindle" is driven by "worm wheel gear." A wheel on the "second motion shaft" gears with a worm on the crank shaft. The frame may thus be placed higher from the ground, and give "increased clearance for the cut crop."

4. Friction bowls are placed on the knife bar near its joint with the connecting rod.

5. The last head (4) is "applicable to the bearings of horse works," and especially to the "neck bearing of the upright or other shaft or shafts of horse gear."

[Printed, 4d. No Drawings.]

A.D. 1863, April 7. -No. 874.

BAMLETT, ADAM CARLISLE.—"Reaping and mowing machines."

1. When the pole is mounted with a universal joint at its point of connection to the frame, projections or chains are so fitted thereto, as to limit the movement of the pole, and prevent its taking a position at more than right angles to the side of the frame.

2. To alter the "pitch" of a "tilling platform" it is mounted in a frame jointed "near the front edge of the plat-

"form." This frame is acted on by a lever or equivalent below it, by which its "pitch" can be altered. A similar arrangement can be applied to platforms otherwise mounted.

[Printed, 16d. Drawings.]

A.D. 1861, April 7.—No. 890.

HOWARD, JAMES, BOUSFIELD, EDWARD TRYNY, and PINNEY, JOHN.—Agricultural team engines and implements.

The first part of the invention relates to team engines.

The second part relates to a method of raising the "pitch" of "double action" ploughs. Each rocking frame is lifted separately. A chain from the rocking frame is attached "through" "cranked links" to an arm on a cross-shaft on which are fixed a pair of coiled springs which tend to revolve the shaft; these "cranked links" are so mounted that they lock in one position and require to be pulled over by a hand lever. The frame is raised by hand, with the assistance of these springs.

The third part relates to a method of applying the "fly-rope" system to double action ploughs. The rope is led over a pulley at the top of the implement, whence motion is communicated to a spiked wheel which acts against the ground and propels the implement.

[Printed, 1s. 10d. Drawings.]

A.D. 1863, April 10.—No. 911.

WIGHTMAN, JOHN, and DENING, CHARLES.—(*Provisional protection only.*)—Horse rakes.

The following is the whole Provisional Specification:—

"Our invention of improvements in horse rakes consists in  
 "making the tines of such rakes of tubular or hollow form,  
 "whereby the rake is rendered much lighter in draught, it is  
 "also easier to lift when working; these tines are very stiff,  
 "and therefore keep their proper shape and distance apart  
 "from each other better than ordinary tines. We either  
 "make them tubular or of a hollow U or gutter form in cross  
 "section, and either of steel or iron, inserting and welding in  
 "the end of each tine a solid piece of steel, which is drawn  
 "down to form the point."

[Printed, 4d. No Drawings.]

A.D. 1863, April 13.—No. 929.

REEVES, ROBERT.—“Liquid manure drills.”

Instead of forming the dipping wheel of such implements with separate cups bolted thereon, the wheel is cast with the cups on it. By preference the mould for casting the wheel is made as follows:—“The pattern is made with blocks on its side to form the external part of the cups or dippers, each block having a projecting part to make a seat for a dry sand core which forms the inside of the cup or dipper. When the casting is made with cups or dippers on each side, two sets of blocks are used on the pattern, and two sets of dry sand cores are used.”

[Printed, 3d. Drawing.]

A.D. 1863, April 21.—No. 995.

CAMBRIDGE, WILLIAM COLBORNE.—“Construction of harrows.”

Improvements upon prior inventions by the patentee.

1. In No. 2617, A.D. 1861, a method was described of securing the tines by using trough shaped beams in which cross-heads formed on the tines were secured by bolts and screws. In place of these bolts the inventor proposes to use a “transverse bar of iron with notches or recesses cut therein, into which fit moveable clamps or wedges, one clamp being so disposed on the one side of the tine as to force the cross-head of tine tightly into the trough, while another clamp serves to maintain the tine on the other side by bearing against the reverse or plain side of the beam.”

2. The object of this part of the invention is to combine the effects of a chain harrow and a tine harrow. In the harrows described in No. 1153, A.D. 1857, “coupling tined links” are substituted “for the links heretofore employed in connecting lengthwise the transverse rows of chains.”

3. The “flexible bars” described in No. 1153, A.D. 1857, are “so arranged as to enable the tines to cut in lines two inches apart.” The inventor also employs the method described in No. 706, A.D. 1859, of “dividing the chain harrow into two or more parts by means of hooks with transverse rings,” but he proposes to “substitute one of the eyes of the coupling tine link for the hook heretofore used.”

[Printed, 10d. Drawing.]

A.D. 1863, April 22.—No. 1001

GRACE, THEODORE.—(*Provisional protection only.*)—"Reaping  
" and mowing machines."

1. Delivering apparatus. Endless chains driven from the bearing wheels traverse the platform and "by means of suitable snugs give motion to a cross piece, and cause it to traverse backward and forward from side to side of the machine." This cross piece has on it teeth, "which are held in a vertical position whilst raking off the corn, but in the return movement they lay horizontally under the platform." "Or, instead of the cross piece, motion is given to chucks, which carry the rakes by revolving studs which take hold of the endless chains, and so communicate the necessary alternating motion." "At the delivery side of the platform there are teeth to prevent the corn from being raked off until a sufficient quantity has been collected to form a sheaf, these teeth are held in a vertical position by a catch, which is released by the action of the machine."

2. The cutters are actuated by a band on the main shaft driving a crank shaft. The connecting rod from the crank is joined to the centre of the knife bar instead of the end. The finger may be supported by "a fluted roller under the centre" or by wheels."

[Printed, 4d. No Drawings.]

A.D. 1863, April 25.—No. 1033.

NUNN, JOHN PHILLIPS, and NUNN, EDMUND BROOK—"Hoes  
" and cultivators."

The invention "consists in the employment of a circular disc or polygon with the cutting edge or edges placed horizontally, or at a slight angle to the horizon, and fitted on the lower end of an upright shaft free to revolve and also to rise and fall within certain limits in a tube or tabular bearing fixed in or connected to a beam." The hoes can be adjusted along the beam as required; the beam is mounted on wheels in the usual manner.

[Printed, 8d. Drawings.]

A.D. 1863, April 30.—No. 1090.

MITCHELL, EDWARD.—(*Letters Patent void for want of Final Specification.*)—"Reaping and mowing machines."

The invention consists in "the application of horizontal  
" knives (with three or more blades) or cutters with or with-  
" out serrated edges." These cutters are fixed "one on each  
" side of the machine & upon the same level, and close to the  
" ground." They are driven in opposite directions by suit-  
able gearing. In front of each cutter is fixed a wheel which  
serves to raise the cutter over irregularities in the ground.  
The shafts carrying the cutters are jointed or otherwise  
mounted so that they can rise and fall without interrupting  
their motion.

[Printed, 4d. No Drawings.]

A.D. 1863, May 9.—No. 1176.

LEE, JESSE, and GUTTERIDGE, MATTHEW.—(*Provisional protection not allowed.*)—"Agricultural implements."

1. Ploughs are made with the handles and beams of gas tubing.

2. Harrows are made of gas tubing, and they have given to them "an oscillating motion, derived either from two cranks  
" or from two eccentrics working on a shaft supported by two  
" wheels in front."

3. In hay-making machines, the inventors say:—"We  
" have a double crank or eccentric shaft, which crosses the  
" front of the machine, said shaft having a connecting rod  
" on each side of the machine attached to flat sliding plates  
" in each of which a suitable annular groove or slot is cut  
" across for the purpose of acting in a wedge-like form on  
" the reversing fork and by these means forcing said fork  
" either backward or forward as required. The motion to  
" the said sliding plates may be given thereto by turning par-  
" tially round the before-mentioned crank or eccentric shafts  
" by means of a winch handle or otherwise, the last-mentioned  
" fork sliding in a slot or groove cast in the heads of the  
" machine parallel with the solid main axle which carries  
" the aforesaid heads."

4. In horse rakes, "the teeth are formed curved and so  
" fastened to the frame that each tooth can be taken out



"separately. The height of the shafts can be regulated by their "sliding up a half quadrant "

5. Hand rakes are mounted on wheels, and have teeth similar to those above described under (4).

6. "Subsoil looseners" "are formed by adapting a piece of iron to the body of a plough;" "at the end of this piece of iron is fastened at right angles another piece of iron ending in either three tines or in one scuffler" "Said subsoil loosener can be lifted out of the ground when necessary by a lever passing along the side of the handles of the plough "

[Printed, &c. No Drawings ]

A.D. 1863, May 12.—No. 1188.

MATTISON, WILLIAM, and BARKER, GEORGE.—(*Provisional protection only.*) "Mowing and reaping machines "

The following is the whole Provisional Specification :—

"The object of this invention is to simplify mowing and reaping machines, and to have the cutting apparatus and the gearing for giving motion thereto so constructed and arranged as to be self-adjusting to the inequalities of the ground, also to be readily raised or lowered and put into or out of motion by the attendant. The cutting apparatus is mounted or carried on framing which is hinged on bearings in the form of bushes fixed to the ordinary framing of the machine, concentric to the axle thereof, and so as to allow freedom of motion. A cog wheel is placed on the axle capable of sliding into or out of gear with another wheel on a worm wheel fixed on a shaft mounted on the moveable framing, on which shaft is a crank for giving motion to the said cutting apparatus. The apparatus is raised or lowered, and the gearing put into or out of motion by means of levers or equivalent appliances."

[Printed, &c. No Drawings.]

A.D. 1863, May 12.—No. 1190

WICKENS, HENRY —(*A communication from Richard Lamb Allen.*)—(*Provisional protection not allowed.*)—"Reaping and mowing machines."

The following is the whole Provisional Specification : —

“ The cutting apparatus of the machine is constructed and arranged to be worked on either side of the machine, and either in front or rear of the wheels, and the draught rod is arranged that the line of draught may be taken from the inside shoe or from its immediate vicinity, and by my improvements the folding finger bar is sustained in the folded position while the machine is in motion from one place to another and the gearing which drives the cutting apparatus is closed in for exclusion of dust and dirt, and I have an adjustable track board for disposing or controlling of the cut grass, and a means of turning the finger bar on its longitudinal axis, so as to elevate or depress the points of the guard fingers, which are constructed in a particular form at pleasure, without changing the relations of the bearings to each other at the two ends of the connecting rods.”

[Printed, *ad.* No Drawings.]

A.D. 1863, May 26.—No. 1325.

BUCKINGHAM, JAMES. — (*Provisional protection only.*) — Ploughs.

The following is the whole Provisional Specification :—

“ This invention consists in certain improvements in the construction of ploughs, the object being to effect the lifting of one mould plate up and the bringing the other in its proper place to work, at the same time the share is turned upside down, the whole being secured in its place while being changed from right to left. I propose to apply two axles or shafts to the plough, the under one being in connection with the share and the upper one in connection with the mould plates, both axles being connected by means of an eccentric and crank. In some cases I dispense with the top axle and effect the change by an eccentric wheel on the under axle, close to the body of the plough, and two chains connected to the wheel and the fixtures of the mould plates, by which means I very much simplify the movement, decrease the weights of the plough and render it less liable to get out of order.”

[Printed, *ad.* No Drawings.]

A.D. 1863, May 30.—No. 1359.

HEARD, JOHN.—(*Provisional protection only.*)—"Apparatus for distributing manure"

The following is the whole Provisional Specification:—

"This invention consists of an arrangement of broad cast manure distributor mounted upon running or travelling wheels in the usual manner, but provided with two rollers extending the entire width of the implement. These rollers are studded with teeth or short projections, and are situate side by side, and are driven by suitable gearing. The one serves as a dipper to deposit the manure, whilst the other acts as a cleaner when damp manure is employed. It is also provided with two shakers for the purpose of preventing the choking of the manure in its passage from the top to the under box."

[Printed, &c. No Drawings.]

A.D. 1863, June 1.—No. 1368.

DAVEY, JOHN.—(*Provisional protection only.*)—"Horse rakes.

The following is the whole Provisional Specification:—

"My invention of 'improvements in horse rakes' has for its object to give increased rigidity and strength to the implement, and also to lighten the draught. To this end I form the 'head' of the implement of trussed iron, by connecting together by bolting or otherwise, two pieces of concave iron, which are supported or trussed from the inside by blocks of iron, wood, or other suitable material. The teeth are also made of trussed iron formed of two pieces of concave iron welded together at the ends and filled in or partially filled in with wood. The next improvement consists in adapting to the inner ends of the handles wheels to support the implement and lighten the draught. By this means the implement will not drag on the land, thereby preventing injury to the seed of clover and grasses that may be sown. The suspension of the head by means of the wheels above mentioned will prevent the grain from being knocked or beaten out while being collected. A spring fastening is applied to the handles in order to prevent the rake from turning over while in use."

[Printed, &c. No Drawings.]

A.D. 1863, June 1.—No. 1370.

BELCHER, CHARLES. — (*Provisional protection only.*)—"Im-  
"provements in cutting and transplanting turf, and in  
"apparatus to be employed therein which apparatus is also  
"applicable to the extraction of weeds and to the planting of  
"seeds, roots, sets or plants."

The following is the whole Provisional Specification:—

"This invention relates more particularly to what is generally  
"known as the inoculation of land by planting pieces of turf  
"land in arable land with a view to the making or improving  
"of pasture fields and lawns, and consists in punching or  
"cutting out small portions of turf by the aid of a peculiar  
"instrument similar in principle to a gun-wadding punch.  
"The pieces so cut out are then collected and inserted or  
"plugged into corresponding holes in the land to be converted  
"into pasture land. The same method is of course applicable  
"to the improvement of poor pastures by inserting or plug-  
"ging in portions of turf at intervals taken from a rich  
"pasture. The instrument employed may be adapted either  
"for hand use or for horse or steam power. For hand use  
"the cutter, which is of a tubular shape of any desired  
"sectional form, is fitted to the bottom of a handle similar  
"to a spade handle, and provided with a foot rest to enable  
"it to be thrust into the ground by the pressure of the foot,  
"or otherwise as found most convenient in practice, or a  
"number of these cutters may be fitted to a rammer or they  
"may be fitted to the surface of a wheel or roller drawn or  
"pushed over the surface of the land by hand, or by horse  
"or other power. When a roller form is used the pieces of  
"turf are collected in the interior of the roller and discharged  
"at intervals or continuously from one or both ends of the  
"roller, a door being provided, if desired, at the ends of  
"the roller to allow the pieces to escape when required.  
"The hand instrument used as a rammer may be advan-  
"tageously employed for extracting weeds, such as plantains  
"from lawns. Another use to which the implement or  
"instrument may be applied is the cutting of holes to receive  
"potatoe sets or seeds and compost or other substances."

[Printed, 4d. No Drawings.]

A.D. 1863, June 2.—No. 1372.

MELLARD, JAMES.—(*Provisional protection only.*)—"Double moulding or ridging ploughs."

The following is the whole Provisional Specification:—

"These improvements in double moulding or ridging ploughs consist in arrangements for readily and conveniently adjusting the width between the two turn furrows or breasts of the plough. For this purpose a horizontal shaft works in a central bearing on the plough frame, at right angles to the line of draught. The two ends of this shaft are formed respectively into right and left-handed screws, right and left-handed screw nuts to correspond are attached by jointed links to the inside of the breasts or turn-furrows. Upon motion being given to the screw shaft by a suitable handle, the two breasts or turn-furrows of the plough approach to or recede from each other equally, according to the direction in which the screw shaft is turned; or I employ a single screw acting upon a traversing nut connected to the two breasts or turn-furrows of the plough by jointed levers, the angular motion of which causes the breasts or turn-furrows to approach to or recede from each other equally according to the direction in which the screw is turned."

[Printed, &c. No Drawings.]

A.D. 1863, June 2.—No. 1379.

JARRY, ETIENNE JOSEPH.—"Machinery to be worked by steam or other power for clearing and ploughing land."

A frame carrying tilling implements is connected to the rear of a traction engine. The implements are mounted on jointed arms pivotted to a transverse shaft at the rear of the frame and are actuated by cranks or eccentrics on the shaft of the bearing wheels by which the implement frame is carried. These wheels are rotated by a driving band from the engine. The apparatus may also be operated by a traction rope in any usual manner.

[Printed, 10d. Drawings.]

A.D. 1863, June 5.—No. 1404.

SEAMAN, JOSEPH.—"Implements to be used in the cultivation of the soil."

A method of raising the tines of cultivators simultaneously to the ground. A lever, connected to the front of the inner frame carrying the tines, is pivotted on a transverse shaft. Short levers connected to the back part of the frame are pivotted on shafts geared to the first-named shaft, so that by pressing the main lever both ends of the frame are raised simultaneously. In heavy implements more than one lever may be used; also a screw may be used instead of a lever.

The tines of harrows are secured by "a loose clip, one side of which fits on to the side of the beam, and the other side has a recess for holding the tooth, the clips and teeth being firmly held to the beams by bolts or pins passing through the beams, clips or teeth, each row of teeth being secured by one bolt," as in No. 972, A.D. 1859, "or a separate bolt may be used for each tooth and clip." Also an "expanding clip" may be used; in this case the bolt passes through the ends of the clip, and not through the tooth.

Method of constructing and fitting wheels for agricultural implements. The inventor says:—"On the frame, or that part of the implement whereon it is intended to fix the wheel, I form a cylinder, the inner part of which is much larger than that part next to the wheel. Within this cylinder I place a journal that fills the inside at each end, but is recessed in the centre; the end of this journal projects through the small end of the cylinder, a hole being made entirely through the centre of this journal, wherein the stump of the wheel is firmly secured. A cap is then applied tight on to that end of the cylinder where the journal is inserted, which will enable it to carry as much oil as the cylinder will contain without escaping at the small aperture. The stump of the wheel is fixed firmly into the journal, and provision is made in the socket of the cylinder, namely, that part which takes the wheel standard, for carrying the oil under that part of the boss of the wheel which projects over the end of the cylinder." A packing of white metal may be inserted between the nave and the end of the cylinder.

A method of mounting wheel slides and standards. A steel plate is secured to the plough beam by bolts through slots, the same bolts also passing through slots in the wheel slides to secure them to the plate. The slides fit in grooves in the plate. The standards are similarly mounted.



5 The "share lever or lever neck is made in two parts, the " part to which the share is fixed passes through a socket at " the share end of the frame, whilst the other part is fixed to " the hinder part of the frame; these two parts are then " connected by a coupling" with right and left handed threads.

6. Whipple-trees are made " of two flat bars of steel separated by blocks." The bars are connected by rivets, and the draught hooks are attached to the blocks.

[Printed, 1s. 2d. Drawings.]

A.D. 1863, June 16.—No. 1503.

MANWARING, WILLIAM.—"Harvesting machines."

Reaping and mowing machines with "two driving wheels " and a trailing beam" are fitted with a double-stroke cutting " apparatus " such as that described in No. 2706, A.D. 1859. To enable the finger beam to rise and fall with inequalities of the ground it is attached to "a lever having a slot or slots " which are made to embrace two or more projections in the " body of the machine by preference between the driving " wheels." "The beam may be hinged or otherwise attached " to the lever" preferably "by a wide open hinge through " which the knife and connecting rod can play." A pull and ratchet may be mounted so that the beam may, when required, be held in a rigid position. When one driving wheel only is used, it is formed with a cogged flange which drives a worm from which the crank is driven that actuates the cutter. "To put the " cut crop into swathe," there is hinged "to the off shoe of the " finger beam, or to a prolongation thereof, a so-called swathe " turner or dividing board of concave form, the concave front " being next to the cut crop." To deliver the crop there is an inclined shaft carrying "rake and reel arms." "The latter " are rigidly connected with the shaft, so as to describe a " circular path, but the former are pivoted to a disc or to " radii, so that they have a tendency to fall into the standing " crop or upon the platform, and sweeps it clean." "The " extent of this fall is limited by a stationary inclined surface " or surfaces around the inclined shaft."

[Printed, 10d. Drawing.]

A.D. 1863, June 17.—No. 1514.

**BANWELL, JOHN.**—“ Combined machine for collecting and “ placing in rows, or collecting and elevating into a waggon “ or elsewhere, hay, corn or other agricultural produce.”

A “trailing rake” is mounted underneath a suitable wheeled frame. Its teeth are kept to their work by springs or weights. In front of this a revolving rake works, which may consist of a drum with eccentric teeth which are projected and withdrawn alternately. This revolving rake delivers the crop to a platform whence it is raised by an endless band carrying prongs, and delivered to other bands running across the machine so as to deliver at the side either continuously or, by suitable arrangements of the teeth, intermittently. The crop may also be raised to be loaded on a waggon, &c., by an endless band with spikes, mounted on a suitable adjustable frame that can be hinged to the main frame of the implement. “Screw drums “ or cylinders or bar rakes working on cranks” may be used instead of the endless bands for elevating or delivering the crop.

[Printed, 1s. 2d. Drawings.]

A.D. 1863, June 22.—No. 1574.

**BURGESS, CHARLES THOMAS.**—Reaping machines.

Improvements on No. 2896, A.D. 1861. In that Specification one of the arms of the reel is so mounted that “when the arm is “ vertically or nearly vertically under the shaft, it stops revolving therewith, and itself turns partly round about a vertical “ axis, in the course of which motion the beater sweeps the “ cut crop off the platform.” According to the improvements this motion can be interrupted at will, so as to allow a sufficient quantity to collect before it is pushed off by the rake. On the reel shaft is a tube which turns freely thereon. On this tube is “a short axis at right angles with the shaft of the reel, and “ on this short axis is fixed the arm of the clearing beater, “ which is suitably counterpoised.” “On the tube is also “ mounted a spring catch, the end of which rests on a flange “ fixed on the shaft of the reel; this flange is notched, and so “ long as the clearing beater arm is revolving with the reel “ the end of the spring catch lays in this notch; but when “ the time comes for the beater to make its clearing motion,

" an inclined stop carried by the frame is caused first to lift  
 " the spring catch out of the notch, and then to hold and stop  
 " it, so as to retain the tube whilst the shaft of the reel con-  
 " tinues to revolve, the arm is then caused to rotate partially  
 " by a connecting rod, which links an arm on the shaft of the  
 " reel with the arm of the clearing beater. When the beater  
 " arm has completed its partial rotation, a cam on the shaft  
 " of the reel moves the inclined stop out of the way and then  
 " the shaft of the reel continues to revolve, the clearing beater  
 " with its arm assume their original positions, their own  
 " weight causing them to do so; the spring catch imme-  
 " diately falls again into its notch, where it remains until it  
 " is again lifted by the inclined stop." The stop is held in  
 " its place by a spring, which yields to the cam. To stop the  
 " action of the "clearing beater" a treadle is fitted which by  
 " means of a connecting rod raises the stop and allows the beater  
 " to work with the shaft during the whole revolution.

The "stationary cam course" described in the former Specification can be clutched to the shaft, so as to revolve therewith and therefore become inoperative to produce the "discharging action." This is effected by the action of a treadle worked by the driver's foot.

[Printed, 1s. 4d. Drawings.]

A.D. 1863, July 6.—No. 1672.

GOWER, ANDREW, and GOWER, BENJAMIN SMITH.—"Sowing  
 " and harrowing machine."

A distributing box is mounted on a suitable frame with bearing wheels. From the axle of these wheels motion is given to an eccentric which causes a perforated slide to reciprocate over perforations at the bottom of the box. The eccentric being adjustable, the delivery of the seed is thus regulated. A harrow is attached behind the frame.

[Printed, 3d. Drawing.]

A.D. 1863, July 8.—No. 1696

PREECE, THOMAS.—"Corn and seed drill."

1. The "seed box" is fitted to the frame of the machine instead of being fixed on the top of the "corn box" "as hitherto invariably practised."

2. At the back of the machine there is a hand lever keyed upon "a shaft having a cam at one end which acts upon a " side lever, which " "throws the driving wheels out of gear " and stops the delivery of the seed;" "the depression of the " hand lever at the same time raises the coulters out of the " ground by means of two other levers keyed on the same " shaft and connected to the coulters bar " Thus the coulters are raised and the seed delivery stopped by the same action.

[Printed, *8d.* Drawing.]

A.D. 1863, July 10.—No. 1726.

HORNSBY, RICHARD, junior, BONNALL, JOHN, and AST-BURY, WILLIAM. —Traction engines, agricultural implements, &c.

The portions of the invention relating to the present series are as follows :—

1. A steam plough is mounted on a frame with three wheels, two in front linked together and mounted as steering wheels, and one behind to run on the land. These are all adjustable in height. The ploughs are all alike, and " consist of a body " and beam made of one piece of wrought iron, which receives " the share, mould board and coulters." The fore end of the beam is jointed in a forked standard, so that it can swivel on a centre placed "as nearly as possible over the point of the " share." A rod jointed to the hinder part of the beam is connected to an arm on a transverse shaft at the front of the frame, so that by rotating this shaft all the ploughs are raised. Double ploughs may be similarly constructed, the ploughs at each end being raised and lowered separately by separate shafts, or operated simultaneously by the same shaft. Other tilling implements may be similarly mounted.

2. When lever necks are used, the fore part of the mould board is connected to the lever neck, "so that it may move " therewith, and then the adjusting of the share by means of " the lever neck will not affect the truth of the surface formed " by the share and mould board."

3. To protect the teeth of harrows from wear, they are fitted with "socks" preferably of chilled cast metal, "which fit over " them, and are secured in any convenient manner."

[Printed, *4s. 4d.* Drawings.]

A.D. 1863, July 14.—No. 1781.

HORNSBY, RICHARD, junior, and PHILLIPS, JAMES EDWIN.  
"Reaping and mowing machines."

1. This head refers to machines in which the crop is delivered by a platform composed of parallel bars, which is lowered so as to drag on the ground, and allow the crop to be drawn off as the machine progresses. According to the improvements, the bars are cranked, so that when the platform is lowered, they rest with nearly their whole lengths on the ground. The platform is raised and held up by a treadle, on which the driver presses his foot; when his foot is lifted, the platform falls by its own weight.

2. The shafts are connected to "the fore end of the frame between the two side bars of which the driving wheel is received, and the hinder ends of the shafts come on either side of such frame." "The back ends of the shafts turn on a bolt which passes through them and through the fore end of the frame which is raised or lowered by a hand wheel and screw acting on the hinder ends of the shafts."

3. When the crop is delivered at the side, the "hinder parts of the framing" are "connected to and carried by arched connecting pieces from the front framing, and the cut crop as it is being delivered passes under these arched pieces." When a trailing rake is used to gather the crop on the ground into sheaves, it is operated by the chain which drives the reel, this chain being led over pulleys, one of which is on the shaft of the reel, and the other on the axle of a wheel with a tooth which at each revolution operates a lever to raise the rake. There may be endless bands travelling across the platform.

4. A wheel may be mounted "under the platform." It slides on its spindle, but is kept in place by a spring.

Besides the above there are some improvements referred to in the Provisional Specification only. Some of these refer to "hand" machines; others to a method of driving the cutters by a wheel with a cam groove on the shaft of the bearing wheels, and of increasing the speed of the cutters by additional gearing.

[Printed, 1s. Drawings.]

A.D. 1863, July 14.—No. 1762.

WOOD, WILLIAM.—“‘Warping’ or covering land, bog, or  
“ peat with earth or soil.”

When the land lies too high to be flooded with water carrying earthy matters, &c. in suspension, the water is to be pumped on to the land and retained by suitable embankments until it has deposited the matters in suspension.

If the water does not contain a sufficient amount of these, they may be mixed with it. Also any suitable material may be ground fine and blown on to the land.

[Printed, 4d. No Drawings.]

A.D. 1863, July 14.—No. 1764.

ROBERTS, WILLIAM.—(*Provisional protection only.*)—Ploughs.

The inventor says:—“My improvements in ploughs relate  
“ to the construction and conformation of the frame. It is  
“ formed by forging the left handle of the plough and the  
“ fore part of the frame in one piece of wrought iron, which  
“ carries the share nose and ear for breast bolt.”

[Printed, 4d. Drawing.]

A.D. 1863, July 21.—No. 1827.

HASELTINE, GEORGE.—(*A communication from John Kelsay.*)  
—“Implement for harrowing and smoothing land.”

The harrow is “double V-shaped” formed of two V-shaped pieces, and one within the other, the sides of the inner V being produced and joined to the outer V. One side also of the outer V is produced, and a tooth fixed therein. There is a transverse brace, from which rise uprights supporting a transverse handle. This handle is connected to the front of the harrow by a brace. The “draught tongue” is fitted on by a “hook-and-eye joint.” A curved piece of metal passes through a slot in the tongue, and prevents it from moving. Behind the harrow a scraper is fitted. Its object is “to smooth the surface of the ground after the harrow.” A rake may also be used as well as, or in place of, the scraper.

The harrow may also be reversed and the draught attached to the cross bar at the rear of the frame. In this case a handle is attached to the cross bar by a “hook-and-eye joint,” and to the point of the frame in any suitable manner.

[Printed, 10d. Drawings.]

F. J.

B R



A.D. 1863, July 22.—No. 1839.

SIMMONS, JOSEPH.—Ploughs.

The ploughs are of the class "known as 'the turn-rist " "ploughs'." The axle is so mounted that it may take any angle, allowing one wheel to run on the land and the other in the furrow, while the rest of the plough is vertical. The beam is attached to an upright bar, so as to be adjustable in height thereon, and this bar swivels on the axle, its play being limited by a slot in a beam mounted on the axle. A lever is pivoted to a point above the axle in front. This upright passes through an opening in this lever which rests against stops on a horizontal bar behind. By this means the amount of movement of the axle is limited.

[Printed, *sd.* Drawings.]

A.D. 1863, July 23 —No. 1849.

PERKINS, THOMAS.—(*Provisional protection only.*)—"Horse " rakes and hand rakes "

At each end of the head are attached "wheel arms" carrying small wheels. Or instead of these "slide arms" may be used, at the ends of the head or at suitable distances along it.

"Lengthening pieces" may be fitted to the head by means of sockets.

The head may be made in separate pieces hinged together. "The joints may be locked to render them rigid."

[Printed, *sd.* No Drawings.]

A.D. 1863, July 30 —No. 1884

BRANFORD, JOHN WILLIAM—"Implement for hoeing and " cleaning the land and for cutting and setting out the plants " of root crops."

Rotary hoes and "trailing hoes" are mounted in a suitable wheeled frame. The rotary hoes have adjustable stems, and act in a plane at right angles to the line of traverse. The "trailing hoes" follow the rotary hoes. There is an overhead lever, by which the rotary hoes are raised. Either sort of hoes may be used separately. Instead of the "trailing" hoes, a hoe rotating on a vertical axis may be used. By turning the rotary hoes on their stems, the effective size of the blade can be varied. The axle of the wheels is telescopic.

[Printed *sd.* Drawing.]

A.D. 1863, August 11.—No. 1984.

**GRAY, WILLIAM**—"Certain parts of reaping machines."

The improvements refer to the delivery apparatus.

The cut crop is received on a "tilt board" which slopes backwards from the cutters, and is pivotted on a transverse axis. It is tilted at intervals by the attendant, by means of suitable apparatus, to throw off the crop. Behind this is a smaller "tilt board" with a counter-balance weight. On this a band is laid by a second attendant, and the action of the first board upsets this, so that the sheaf falls on the ground with the band below it ready for tying.

Instead of this arrangement, the second platform may be fixed to the end of the first so that the band and sheaf are thrown on the ground by the same motion. In this case the end of the first platform is hinged, and falls partly over, to allow room for access to the second. Instead of a "tilt board," a "discharge board hinged at one end" may be used. The "tilt board" has inclined sides, or sides hinged so that they can be set at any required angle, to form the crop into a sheaf. Or "the side of the tilt board may be made to work against a fixed stud attached to the fixed framing of the machine, so that the necessary angular action upon the grain can be adjusted at any moment."

[Printed, 10d. Drawing.]

A.D. 1863, August 18.—No. 2055.

**MC CORMICK, CYRUS HALL**—"Reaping machines."

1. The first part of the invention refers to machines with a self-acting delivery rake. It consists in raising the side of the platform "above the plane thereof"; "the rise commences at or about the point where the rake begins to rise on leaving the platform, and should be graduated to correspond with the curve described by the rake." "By this arrangement the heads of the corn as they pass over the platform are raised, and are kept from contact with the stubble until the sheaf is sufficiently turned and thrown round, while the rake retains its hold longer in order to deliver it properly."

2. This part is applicable to all reaping machines. It consists in connecting to the "inade of the frame to which the

"pole is connected" "appliances" to direct inwards the ears which "lean outwards towards the wheel and frame" "These appliances consist of a board or plate extending forward from the cutting apparatus, the rear part of which board is placed above the cutting apparatus and is nearly horizontal, while the fore part is inclined downward so as to come near to the ground. A vertical board or plate fills up the space between the first-named board and the inner frame of the machine." This board is adjustable vertically to suit the height of the crop or inequalities in the ground.

[Printed, 10d. Drawings.]

A. D. 1863, August 28.—No. 2128.

ALISON, JOHN.—"Apparatus for tilling land."

1. A plough to be worked by steam power is described. The frame is mounted on three wheels, two on the land side and one which runs close by the ploughed ground and in front of the set of ploughs in action. There is a set of ploughs at each end of the frame, each set being mounted on a shaft at diagonally across the frame. The ploughs are kept apart by filling pieces on the shaft, by altering which the distance apart of the ploughs can be varied. On each shaft is an arm to which either traction rope is attached. The rope first actuates the arm to rotate the shaft, and thereby raise the ploughs thereon from the ground. As soon as the draught comes upon the frame, the hinder set of ploughs is drawn into the earth. The return rope is laid out on the ground by the arm connected to the hinder set of ploughs. The implement is steered by the two land wheels, which have vertical screws with quadrants engaging with worms on longitudinal shafts operated by winch-handles. Other implements may be similarly arranged.

2. Scarifiers are mounted so that they can be drawn in either direction without turning. The tines are mounted so as to swivel on pins, two tines for working in opposite directions on each pin. The draught of the implement draws one set of tines into the ground and throws the other set out. Adjustable stops are mounted on the frame against which the tines rest. The frame is by preference of openwork so that all the tines can be seen and cleared as required. Or there may be two sets of tines, one at each end of the frame, each set acting

alternately. The frame may be in two parts hinged together so that one part may be turned over on the other for passing through gates, &c. One of these parts is provided with two steering wheels, and the other with a single wheel "half way between its two ends."

3. The rest of the Specification refers to improvements in steam engines and hauling apparatus.

[Printed, 2s. Drawings.]

A.D. 1863, August 28.—No. 2129.

HARRATT, CHARLES.—"Apparatus for tilling land."

A series of curved spades are mounted at right angles to radial levers on a transverse shaft across the back of a frame which in front carries a steam engine. The piston of the engine operates a lever mounted loosely on a shaft connected to the spade shaft by an endless chain. The shaft on which the lever is mounted is of a special curved shape, the curve being described by mathematical symbols. This curve is stated to be of such shape that the end of the lever pivotted thereon will pass over it in one direction, but not in the other, so that the vibrating motion of the lever may communicate an alternate rotary motion to the shaft. There is also a hand lever for operating the shaft. The inventor's "patent engine" may be used, "in which the chimney is a hollow piston and "piston rod." No reference is given to any Specification describing such an engine. According to the Provisional Specification, an apparatus for sowing seed may be attached behind the implement.

[Printed, 2s. Drawings.]

A.D. 1863, September 2.—No. 2169.

SIMS, REUBEN.—(*Provisional protection only.*)—"Reaping and "mowing machines."

1. "Duplicate knives" are fixed on the top of the finger bar, so as to act like shears against the vibrating knives.

2. A lever pivotted to the end of the finger beam fits in a slot in the frame, so that in working on a slope, "as the finger beam is raised up this lever butts against its inner end and "against the top part of the lever slot, so that as the beam is "raised up the outer end is thrown higher than the inner "or end next the main frame."

#### AGRICULTURE.

3. The gearing is adjusted by "a suitable weight fixed on the clutch lever, which renders the clutch self-acting in case of forward or backward movements of the machine"

4. The "tip board" is balanced by a weight and lever.

5. The "disc wheel and crank pin" are fitted with a hinged cover.

[Printed, 4d. No Drawings.]

A D. 1863, September 8 — No. 2212.

ADAM, LOUIS.—(*Provisional protects a not allowed.*)—"Machine for mowing grass or reaping grain."

The cutter consists of a disc with a serrated edge revolving between two fixed quadrants on a vertical axis. "The under quadrant has fixed on its edge or periphery rake teeth to collect the grain or grass, and the upper one has also a serrated or screw teeth fixed on its periphery" The rake teeth guide the crop to the cutter, and the revolving teeth act against those on the lower quadrant. On the shaft of the revolving disc are "several horizontal arms having rake teeth, which as these arms revolve, collect the grain or grass as fast as either is cut, and by certain fixed guides so arranged that these revolving arms pass between them, and so cause the grain or grass to be deposited on the ground ready for being collected into sheaves."

[Printed, 4d. No Drawings.]

A.D. 1863, September 21.—No. 2329.

BURGESS, CHARLES THOMAS.—"Reaping machines."

The invention relates to a method of actuating the beater of the reel which sweeps the cut crop off the platform. The arm carrying this beater is hinged to a tube capable of turning on the reel shaft. This tube has motion given to it "by differential toothed wheels, one wheel being on the tube, and the other on an axis constantly driven at the same speed as the shaft of the reel, and in order that the tube may be stopped entirely from rotating, as soon as the beater has been brought over the front edge of the platform, the differential wheel that gives motion to the differential wheel on the tube has a portion of its circumference formed without any teeth upon it; this portion being concentric with the axis

“ upon which it turns; the differential wheel on the tube has  
 “ a recess formed in it, into which a portion of this plain part  
 “ of the wheel enters as soon as the beater is over the front  
 “ edge of the platform; the tube and differential wheel upon  
 “ it are thus prevented from turning, and the beater is then  
 “ raised ” “ to sweep across the platform, and as it so sweeps  
 “ across the platform the other differential wheel continues to  
 “ revolve, and as soon as the portion of its circumference that  
 “ is provided with teeth comes round and gears with the  
 “ toothed portions of the wheel on the tube, the tube again  
 “ revolves with the shaft of the reel, and the differential  
 “ wheels gradually drive the tube at a greater speed than the  
 “ shaft, and so gradually bring the tube into its former  
 “ position relatively to it, so that the beater may be brought  
 “ into proper position for acting as one of the beaters of the  
 “ reel.” To prevent the strain of first causing the tube to  
 rotate from coming on the teeth of the wheels, a projection on  
 the reel shaft comes against a projection on the tube, and  
 causes the tube to revolve.

The following improvements also are referred to in the Provisional but not in the Final Specification:—

A roller is fitted at the edge of the platform, to prevent the crop hanging thereon. This roller may be caused to rotate rapidly.

The reel is constructed so that the beaters can be brought nearer to or carried further from the shaft.

The beaters are carried by arms pin-jointed thereto, and to tubes sliding on the shaft. By fixing these tubes at different points along the shaft, the position of the beaters can be regulated.

[Printed, 10d. Drawings.]

A.D. 1863, September 22.—No. 2339.

BRIGHAM, JOHN, and BICKERTON, RICHARD.—(*Provisional protection only.*)—“ Reaping or mowing machines.”

The invention relates to the delivery apparatus. Two modifications of it are described.

1. A vertical shaft is driven from the main shaft. On the upper end of this vertical shaft is keyed “ a cross piece formed “ of four arms diverging equilaterally from the central boss,



" and having the outward end of each arm turned in an upward direction. A hole is formed in each of the upwardly turned parts to admit of the ends of two horizontal shafts passing through them, the two shafts being arranged crosswise and in planes so as to clear each other in their rotatory movement. Each of the horizontal shafts has keyed to it an iron bar which is bent so as to clear the upwardly turned ends of the cross piece whilst the two extremities are bent in a downward direction, and have attached to each an arm or lever that extends in an outward direction as each arm comes round over the platform." The arms serve both to bring the crop to the cutters, and to deliver it from the platform. "The differential movements of the arms are obtained by means of pawls or pendant hooks fitted to the extremities of the two horizontal shafts." These travel over segmental guides.

2 The shaft instead of being vertical may be set at an angle and the arms bent so that they act suitably on the standing crop and the crop after it is cut.

[Printed, 4d. No Drawings.]

A.D. 1863, September 24.—No. 2351.

WOOFFE, WILLIAM.—"Implements for tilling the soil"

1. The implement "consists of a fixed rectangular frame supported upon two central wheels divided into two compartments on each side of the centre." In these compartments are frames carrying ploughs, &c. These can be raised or lowered by levers.

2. The implement is worked by two engines and drums on opposite headlands. A rope is attached to one end of the implement, led round a sheave below the drum and back to the drum on the opposite headland. A second rope is similarly arranged, starting from the other end of the implement.

3. The Provisional Specification refers to a method of "constructing ploughs with a roller at the back of the sole, in order to diminish draft" No allusion to this appears in the Final Specification.

[Printed, 10d. Drawing.]

A.D. 1863, September 29.—No. 2391.

COOPER, JOHN.—"Construction of harrows."

The improvements relate to a method of securing the teeth. The head of the tooth is slightly increased in size, and formed with a mortise to receive the beam. The teeth are all threaded on the beam, and cross-bars, which are slotted out to fit over the heads, placed in position, thus holding the teeth in their places. The cross-bars are secured by keys or nuts on the top of the heads. Also the tine heads may be forked, and similarly secured.

[Printed, &amp;c. Drawing.]

A.D. 1863, September 30 —No. 2397.

BULLARD, EZEKIEL WILLIAMS.—"Machine or carriage for turning and spreading hay."

A number of lever arms mounted horizontally on a suitable wheeled frame have jointed to their hinder ends suspended arms carrying forks. A double crank shaft is mounted below the levers and so connected thereto as to give a to-and-fro movement to the forks when driven from the bearing wheels. A hand lever is mounted at the front of the carriage, within reach of the driver's seat, by which the frame carrying the forks can be raised. The forks are constructed of a rod bent in a peculiar manner, so as to fit partly round the supporting arm, and form two loops by which the fork is secured to the frame.

[Printed, &amp;c. Drawing.]

A.D. 1863, October 7.—No. 2455.

BUTTON, CHARLES POMEROY.—(*A communication from Walter Davies Sperry.*)—Harrows.

The harrow is formed of (by preference) three wheels mounted on vertical axes carried by a triangular frame, and carrying tines. These wheels are free to revolve as they are drawn over the land. The draught hook is attached to the apex of the triangle, the wheels being arranged so that one precedes the other two. Any number of wheels thus mounted may be used. Bearing wheels are mounted on the upper side of the frame, so that the harrow can be turned over thereon for transport.

[Printed, &amp;c. Drawing.]

## AGRICULTURE.

A.D. 1863, October 16.—No. 2535.

BER, FREDERICK GEORGE.—(*Provisional protection only*)—  
Lamps and stoves for the application of blast heat to horticultural, agricultural, and other specified purposes.

The inventions refer to "a simple 'blast lamp' for small or horticultural purposes" and "a 'blast stove' for larger or agricultural purposes." The stove burns solid fuel. It is so constructed that the air out of any blowing machine "is passed under and through the fire, and as the tendency of flames is to rise notwithstanding the blast of air just mentioned, the air and flames are deflected to the earth by the shape of the roof of the stove, which is curved or 'arched.'" The following are the only applications of the invention to purposes connected with the present series which are mentioned:—"To weed young crops much earlier than the hoe; to improve lawns, meadows, and the like without removing the turf in which the weeds are growing, to char posts and pilings" to prevent their decay.

[Printed, 4d. No Drawings.]

A.D. 1863, October 29.—No. 2676.

EVANS, ORMBOD COFFEEN.—"Digging machinery."

Improvements on No. 2848, A.D. 1855

In the former invention forks on endless chains over rollers were driven into the soil by the rollers. The improvements are as follows.

1. There are two separate frames, an inner one carrying the chains and drums pivotted to an outer wheeled frame
2. A castor wheel is fitted to the front of the outer frame
3. The inner frame is raised by "half spur wheels" at the ends, operated by suitable gearing
4. A seat for the driver is mounted on the top of the carrying frame, with a winch working suitable gearing to raise the digging tools.
5. The carrying frame is raised and lowered on the castor wheel by a screw.
6. A third roller is mounted so as to guide the direction of the endless chains as they leave the ground. Springs are mounted on the roller axles, allowing them to yield to excessive pressure.
7. The teeth are made of sheet steel and curved.

8. The drums have V grooves on them, and the chains carrying the teeth are suitably formed to lie therein.

9. For purposes of top-dressing a separate set of teeth is used, each tooth forming a "beam-like cutter."

10. Also for top-dressing an implement with a single frame may be used. The carrying wheels are mounted on levers, to that the height of the frame from the ground may be adjusted.

11. "Steel disk-cutters" may be mounted on a shaft in front of the diggers.

12. (In the Provisional Specification only). Instead of entire rollers, separate sections may be used, one for each chain.

[Printed, 1s. Drawing.]

A.D. 1863, October 30.—No. 2695.

**BRIGHAM, JOHN and BICKERTON, RICHARD.**—"Reaping and mowing machines."

The improvements relate to the delivery apparatus and include several modifications, some of which are specially applicable to the machine described in No. 751, A.D. 1863.

The gatherer is formed of several arms mounted on an inclined or vertical shaft. These arms are mounted so that they are tilted as they revolve by a fixed piece or friction roller suitably situated on the frame. Certain of these arms are fitted with teeth and are bent so that they sweep across the platform and clear it. Others have no teeth, and serve to bring the crop to the cutters. Or the shaft carrying these arms may be set at a considerable angle and the arms are shaped so that they revolve in the path required without being tilted, the platform, if necessary, being slightly aloped.

The sheaf as it is swept from the platform is thrown upon a band laid down by the machine itself. A continuous band of straw, &c. is contained in a circular receptacle from which it is drawn out along a guide tube by gripping rollers. It is led between a pair of shears, one blade of which is automatically operated from the machine, so as to cut off the lengths required. The lengths of the band may be allowed to fall on the ground or on a board tilted as required by the foot of the operator. Or the bands may be previously cut into lengths, and dropped from a hopper through a door or drawn therefrom by rollers or endless belts.

[Printed, 1s. 6d. Drawings.]

A.D. 1863, November 6.—No. 2752.

SELLAR, ROBERT.—HARROWS.

"This improvement consists in a novel mode of constructing and fixing the teeth or tines of harrows. Near the upper part of the tine there is a hole for the reception of a horizontal bolt, by which the tine is affixed to the beam. The upper part of the tine terminates in a screwed stem, which passes up vertically through the cross bar, and is secured in its place by a nut. By this means the tines are firmly affixed to and hold together the beams and cross bars of the harrow."

[Printed, 10d. Drawing.]

A.D. 1863, November 9.—No. 2785.

RYDER, GEORGE and GUTTERIDGE, MATTHEW.—(Provisional protection only.)—"Hay-making machines."

The following is the whole Provisional Specification:—

"The following is one improved mode of constructing hay-making machines. We have a double crank or eccentric shaft which crosses the front of the machine, said shaft having a connecting rod on each side of the machine attached to flat sliding plates, in each of which a suitable angular groove or slot is cut across for the purpose of acting in a wedge-like form on the reversing fork, and by these means forcing said fork either backward or forward as required. The motion to the said sliding plates may be given thereto by turning partially round the before-named crank or eccentric shafts by means of a winch handle or otherwise, the last-mentioned fork sliding in a slot or groove cast in the heads of the machine parallel with the solid main axle which carries the aforesaid heads. Another improvement in hay-making machines relates to the levers employed to raise the heads, and consists in connecting said levers to the crank shaft for the purpose of preserving the relative position of the grooved sliding plates before mentioned with the heads of the machine as they are raised or lowered."

[Printed, 6d. No Drawings.]

A.D. 1863, November 14.—No. 2861.

WALMSLEY, JOHN.—“Machinery for pulverising and cleaning the soil, and scattering seed, guano, bone dust, and other substances thereon.”

Spiked bearing wheels give motion by toothed gearing to a rotary cultivator at the rear of the implement, this cultivator being mounted on a lever arm pivotted to the axle of the bearing wheels. The draught is attached to this lever, so as to keep the cultivator down to its work. A rake is connected to the end of this lever. The lever can be raised by a winch and chain. At the top of the frame is a seed box, from which the seed falls through an opening that can be regulated by a slide into a chamber in which a cup wheel revolves and delivers the seed to a “caster” wheel which scatters it over the front in front of the cultivator. Or a set of drills may be affixed, to deliver the seed in rows.

The different part of the implement may be used separately, and the seed distributing apparatus may also be used for distributing manure, &c.

[Printed, 1s. 2d. Drawings.]

A.D. 1863, November 16.—No. 2873.

SOVEREIGN, LEVI LEMON.—(*Provisional protection only.*)—“Implement for cultivating land and for sowing seed.”

The implement is mounted on four bearing wheels, two furrow and two land wheels. These are all adjustable, to regulate the height of the implement. Ploughs are mounted on diagonal or other bars across the frame. Behind the ploughs is a box for sowing seeds. One of its sides is perforated for sowing broad-cast, the other for sowing in drills. By means of slides, the amount of seed sown is regulated. Spiked rollers work “opposite these holes,” to keep the seed running freely. The stalk for each plough may also serve to carry a cultivator share instead of the plough, the cultivator share being set at any required angle by a screw. “The implement can be used as a paring plough by bolting a knife or blade to the bottom of the stalk.” The implement can be operated by animal power or steam. In the latter case, the traction rope is wound on a “reel,” by which it can be tightened or slackened as required. Also an “improved



"castor" is used. It "consists of three brackets, the centre  
 "having two slots or grooves, and the two outside brackets  
 "having one slot in each; the two wheels slide to-and-fro in  
 "these slots or grooves to enable the implement to be drawn  
 "forwards or backwards without the castor revolving."

[Printed, &c. No Drawings.]

A.D. 1863, November 23.—No. 2948.

PLATT, JAMES.—"Apparatus for cultivating land."

The greater part of the Specification refers to winding drums, and to methods of communicating motion thereto from the engine. Some improvements in moving anchors are also described, though they are not figured in the drawing.

"All or some of the disc wheels" of the anchor carriage are set at an angle "so that the strain will tend to draw  
 "them deeper into the ground." The "broad wheels" to prevent the frame sinking are mounted so that "the axles  
 "thereof may be allowed to rise and fall to suit the irregularities of the ground." "The drum around which the  
 "headland rope is coiled" is mounted "on a hollow shaft  
 "placed horizontally across the frame, with a slot in it, and  
 "an internal screw working in a nut fixed in the eye of the  
 "drum" "so that the drum can be traversed along the shaft  
 "to direct the strain of the headland rope to any desired part  
 "of the frame." "The drum may be driven by a worm and  
 "wheel or other gearing from the winding drum."

[Printed, &c. Drawing.]

A.D. 1863, December 1.—No. 3011.

GEDGE, WILLIAM EDWARD —(*A communication from Jean Andre Isidore Pharivier.*)—(*Provisional protection only.*)

The following is the whole Provisional Specification:—

"The unproved plough with turning mould board, the  
 "subject of this invention, is especially intended for the  
 "cultivation of sloping ground, and is essentially composed  
 "of a guide and handle of wood, a share with steeled point  
 "extending to a bar, to which it is bolted; the body composed of two cutting edges, forming with the share an  
 "angle of 60 degrees to the center, and fixed fans (which

“ resemble two triangular pyramids (with summit) opposite  
 “ the coulter, a regulator attached to the fundamental  
 “ supports of the plough; a horizontal bar pivoting on the  
 “ middle of the two fundamental supports, and carrying by  
 “ their aid a wing or breast mould board and mould boards,  
 “ which movable advance and retire at the same moment by  
 “ means of the support intended to move the mould boards,  
 “ A hook fixes the mould boards against a vertical rest and  
 “ the bridle which ties the handle. To turn the mould board  
 “ at the end of the furrow the ploughman, furnished with a  
 “ hook, pulls on the handle, pushes a catch, and throws the  
 “ plough on the side, cleans the mould board and the body,  
 “ then lowers the handle, scraping the earth, and relifts, the  
 “ horizontal bar then pivots on itself, the mould board takes  
 “ its usual position, and the ploughing goes on.”

[Printed, 4d. No Drawings.]

A.D. 1863, December 4.—No. 3050.

**GREEN, JOHN.**—(*Provisional protection only.*)—“ Construction  
 “ of harrows, cultivators and ploughs.”

The following is the whole Provisional Specification:—

“ My invention consists in constructing harrows with the  
 “ teeth or tines attached to the frame in an oblique or slant-  
 “ ing position, at angles varying from 10 to 60 degrees from  
 “ the plane of the frame, so that when at work they slide  
 “ along the ground instead of acting on it with the points  
 “ only, like the teeth or tines now in use. The effect of this  
 “ arrangement is that the teeth or tines cut through the clods  
 “ of earth instead of merely moving them, to facilitate which  
 “ the teeth are formed of a knife-like shape. I employ also  
 “ thin edged disc wheels or round plates of iron mounted and  
 “ rotating on a bar or bars and thereby attached to the frame  
 “ conjointly with the teeth or tines.

“ Secondly, in applying my invention to cultivators I  
 “ arrange a number of the before described teeth or tines and  
 “ disc wheels behind or at the back of the frame of the imple-  
 “ ment for the purpose of breaking the clods of earth after  
 “ they have been brought to the surface by the cultivator.

“ Thirdly, in the construction of ploughs I fix a blade or  
 “ knife of a suitable length in or a short distance from the  
 “ centre of the share in a vertical position, and one or more

" similarly shaped knives to the mouldboard or turn furrow,  
 " for the purpose of cutting or dividing the furrow slice  
 " thereby rendering it more friable. Thin edged disc wheels  
 " or circular knives placed and revolving in apertures formed  
 " in the mouldboard have the same effect."

[Printed, 4d. No Drawings.]

A.D. 1863, December 4.—No 3054.

HORNSBY, RICHARD, junior, and PHILLIPS, JAMES ELWIN.

" Reaping and mowing machines "

The pole can be set at any angle required. The driving shaft receives motion from a pinion thereon gearing with internal teeth on the periphery of the main bearing wheel. This wheel is so mounted in lever arms, one of which pivots on the driving shaft, and the other on a stud in the frame opposite the end of the shaft, that it can be raised and lowered as required by a screw and quadrant. The outer end of the cutter bar is kept off the ground by a wheel under the platform as in No. 1761, A.D. 1863. This wheel is mounted in a frame which can be set at any inclination so as to raise and lower the cutter bar. It slides on its spindle, but is kept in its place by springs. The spindle is hollow and filled with oil, which passes through holes in the spindle to the nave of the wheel. Clutches are arranged to throw out of gear the driving apparatus on the chain driving the reel. These are worked by a treadle near the driver's foot. The reel is adjustable, and has a telescopic shaft. The chain is kept tight by an adjustable pulley. The cut crop is delivered from the platform by endless travelling chains. These chains are of different length, so as to carry the crops round and deposit it at right angles to the line of progress. Guide bars are arranged to assist this. The chains have projections on them, and the pulleys on which they run have flanges of corresponding depth.

To deliver the crop in bundles very few teeth are used, or the crop may be received on a rack which is let down at intervals so that the crops may be drawn therefrom. The rack is raised and lowered by the action of a cam on the driving shaft. A special shape for the links of the delivery chains is figured. Instead of chains also " metal bands " with pegs may be used. The rack above may be used without the endless

chains and may receive the crop direct from the cutters. In this case it is formed of metal bars. The rack is raised and lowered by means of a treadle worked by the driver's foot. In machines with this arrangement the cutter bar is supported by an adjustable wheel to regulate its height.

"In 'compound machines' for both reaping and mowing, two wheels on the same shaft and fitted with ratchets are used. To enable the cutter bar to be raised it 'is turned up at its inner end and made into an eye. Through this eye a notched bar passes which is also connected by a joint with the connecting rod linking the cutter bar with the frame. A chain is attached to the notched bar, and by it the said bar can be raised.' 'As soon as the bar begins to rise the eye of the cutter bar drops into one of the notches, thus rendering stiff the joint between the connecting rod and the cutter bar,' so that the latter 'rise bodily, turning about the joint which connects the said rod with the frame.'

[Printed, 3s, 2d. Drawings.]

A.D. 1863, December 8.—No. 3095.

CRANSTON, WILLIAM McINTYRE.—(*A communication from William Anson Wood.*)—"Reaping and mowing machines."

The first part of the invention relates to the delivery apparatus. The platform is cleared by a rake mounted loosely on a vertical shaft, but capable of being clutched fast thereon. "The rake also is capable of turning on a horizontal pin joint near to the vertical axis, so that by turning on the joint the rake can assume a vertical or horizontal position." "Placed around the vertical axis is also a stationary cam surface, such as has heretofore been used, upon which the rake rests, the inclines of this surface being arranged so that when the rake is carried round with the vertical axis, it shall as it comes around in front of the knives or cutters, assume a position parallel with the arm, and as the axis continues to rotate it remains in this position, and sweeps across the platform." During the rest of the revolution it is tilted up nearly vertical. By releasing the clutch the rake is thrown out of action, and the crop is allowed to accumulate on the platform. The clutch is so formed that the rake shall always "come intermediate of the beaters of a reel." "The vertical

" axis is for this purpose only carried by bearings at its lower end, at its upper end it carries a T-shaped socket, the vertical axis being able to turn in the vertical stem; the horizontal portion of the T piece is hollow, and forms a bearing for one end of the axis of the reel," which is driven by bevel gearing from the vertical shaft.

The second part of the invention relates to a method of raising and lowering the frame and cutters. "The fore part of the main frame has connected to it a portion of a circular toothed rack," into which gears a toothed wheel "carried on the end of a radius rod that at its other end turns on a pin or axis carried by the main frame, the radius rod also carries at its outer end the pin or stud upon which the main or driving wheel turns; the toothed wheel is thus always at the same height from the ground; connected to the axis of the toothed wheel is a lever handle by turning which the toothed wheel can be turned, and the circular rack connected to the fore part of the frame can be raised or lowered."

[Printed, 1s. 4d. Drawings.]

A.D. 1863, December 21.—No. 3223.

GREEN, JOHN.—"Harrows, cultivators and ploughs."

1 Harrows are made with the teeth slanting instead of at right angles to the frame; the teeth also are of a "knife-like shape." "Thin edged disc wheels or round plates of iron" are mounted on the frame so as to rotate thereon.

2. In cultivators a number of these "tines and disc wheels" are mounted "behind or at the back of the frame" "Thin edged disc wheels or circular knives, placed revolving in apertures formed in the mould board, have the same effect."

3. Harrows are formed of "zig-zag bars or straight bars" and tubes, connected together by peculiar-shaped teeth or "plates of iron having 3 or 4 corners," so as to act on the soil like a chain harrow.

4. The angle of the teeth can be regulated by a parallel frame and lever, or by their being pivotted on the frame and resting against stops thereon.

5. Slanting teeth may be fitted on the upper side of an ordinary harrow.

6. A "flexible harrow" is formed as in (3). The teeth may be kept in position by tubes, with a jointed rod passing there-through.

7. A "clad-crushing harrow" may be found of "a number" or series of three-cornered bars" with teeth cast or fixed thereon.

8. Several forms of triangular links for chain harrows are figured in the drawings.

9. In ploughs there is a "short knife or cutting blade" which is placed "about the centre of the share." There are "also one or more similarly shaped knives or blades to the "mould board." "Thin edged discs" may also be used. A second coulter may be fitted in front of the usual coulter.

10. The mould board of ploughs may be formed wholly or partly of bars with knife-edges.

[Printed, 12. Drawings.]

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1864.

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A.D. 1864, January 15.—No. 114.

HOWARD, JAMES, BOUSFIELD, EDWARD TENNEY, and PINNEY, JOHN.—"Engines and machinery for tilling land by "steam power."

Various improvements are described in agricultural engines and hauling apparatus, also a method of ploughing by the use of a pair of small engines on opposite headlands. Each of these engines is fitted with a pair of winding drums, one on each side. On one of these drums on each engine the opposite ends of the traction rope is wound. On the other drums a rope is wound by means of which the power of the engine not employed at the time in directly hauling the plough is communicated to the other engine, so that the power of both engines is utilised at once. The engines may be traversed along opposite headlands, or may be stationed in one part of the field and the ropes led over pulleys in the usual way. The ropes from the drums are passed through "the hollow" stalks of guide pulleys which are free to turn like castor



"wheels in any direction." This "allows of the ropes working off at any desired angle." Anchor pulleys are moved by a rope from the engine operating a small winding drum on the pulley frame; this arrangement seems to be only referred to in the Provisional Specification.

[Printed, 2s. Drawings.]

A.D. 1864, January 16.—No. 126.

WOOD, WILLIAM.—(*Provisional protection only.*)—"Machinery for 'warping' or covering land, bog, or peat with earth or soil," &c.

Improvements on No. 1762, A.D. 1863, a method of thus treating land above the tidal level, by "mixing earthy matters with water and distributing the mixture over the land." The soil to be deposited is scooped up by any suitable apparatus and delivered into a holder where it is mixed with water; or it may be placed in a hopper, whence it is delivered by a screw or otherwise to the "mixing holder." The apparatus may be mounted on a locomotive engine, so that it can be moved over the ground as the soil is used up. Or if practicable it may be carried in a boat, and to enable this to be done the ground whence the soil is to be taken may be embanked and hooded. Or, if the soil is covered with water, the soil and water may be mixed up by stirrers and pumped direct on to the land to be "warped." Also the soil may be carried up an inclined plane by scrapers suitably arranged.

[Printed, 4d. No Drawings.]

A.D. 1864, January 19.—No. 145.

COHEN, LEWIS JOSEPH.—(*A communication from Thomas Fawbank.*)—"Apparatus for cultivating."

A broad wheel or drum is mounted in a suitable frame with shafts. A bevel wheel on the axle of the drum drives another wheel on a vertical shaft in suitable bearings. To the base of this shaft is attached a fork, the prongs of which are also vertical. As the implement is drawn over the ground, a rotary motion is given to the fork which acts on the ground and breaks it up. A share may be fixed at the back of the frame, to throw up the loosened soil into furrows.

The apparatus may also be worked by steam, an engine being mounted on the frame, which propels it and operates the fork at the same time. In this case the frame is mounted on wheels, instead of a drum, and one pair of the wheels is used for steering.

[Printed, &c. Drawing.]

A.D. 1864, January 23.—No. 186.

SHAW, JOHN —Harrows.

The invention consists in adding to the front of a chain harrow a portion fitted with tines. This may be effected in various ways, the "tined or pronged portion may either precede the " rows of links or be placed beneath them, or it may be over " the links so that the tines project through them." The last-named plan is preferred, the tines being affixed to "stretchers" of such a form that they can be turned over so as to lie on the top of the harrow with the tines out of action when they are not required. This is effected in the implement figured by making the stretchers angular and jointed to the links so that when turned forward they can be connected by chains to the draught bar and held in position, when turned backward they rest on the harrow with the tines upwards.

[Printed, &c. Drawings.]

A.D. 1864, January 25.—No. 213.

BROWN, ALZIBUS, KNIFFEN, LE GRAND, and DODGE, THOMAS HUTCHINS.—"Machinery for mowing and reaping."

The frame is supported on two wheels, both of which are employed to operate the machinery by internal teeth gearing with pinions connected by ratchets to their shaft. The pole is connected to a frame extending back to the axle of the bearing wheels. On this frame is mounted a quadrant over which is a chain connected to the shoe on the end of the flinger bar, so that by turning the quadrant by a lever the chain is wound up and the front of the frame carrying the cutters is raised. A spring catch holds the lever at any position required, and for further security there is another catch which can be pushed in to hold it. On drawing back the lever the first catch is released by its spring, and the second by a weight. "To " prevent the outer end of the cutter beam from hanging

" down when the inner end is raised with the frame " there is provided " a cramping lever that is attached at the same joint " where the cutter beam is connected to the hangers and " extends on the opposite side to the said outer beam, and is " connected by a link to the pole frame, so that as the cutter " beam and parts are raised said lever causes the elevation of " the outer end of the cutter beam as much as the inner or " attached end." In front of the shoe is an adjustable wheel to press down the cut grass and prevent it from clogging the cutters. The finger beam, &c., can be folded up to a vertical position and held by a catch. The machine is principally intended for mowing, but a platform may be added to convert it into a reaper.

[Printed, 10d. Drawings.]

A.D. 1864, January 27.—No. 229

GEDGE, JOHN.—(*A communication from Jean Germain Félix (Lunigerau).*)—Ploughs.

The plough described is intended principally for use in vineyards, but it may be employed in working between rows of plants of any kind. Its object is to cut away the mass of shoots, weeds, &c. which surround the vine stem. It resembles the plough " ordinarily used in vine growing countries " but has behind the ordinary share a small plough body mounted on a vertical stem pivotted to the main body. By means of a handle beside the ordinary handle (one stilt only appears to be figured), the point of the small plough can be moved out to a greater or less angle, so as to bring it into or throw it out of action as required. The object of this is to allow the plough to work close alongside of a row of vines, the small plough being caused to act on the spaces between the vines, and withdrawn as the implement approaches a stem.

[Printed, 6d. Drawing.]

A.D. 1864, February 8.—No. 327.

PIDGEON, DANIEL and MANWARING, WILLIAM.—(*Provisional protection only*)—"Reaping and mowing machines."

1. The first part of the invention relates to machines in which the crop is raked off the platform by an attendant, and consists in fitting on the platform, at the side next the standing crop, "a traversing tipping or tilting apparatus, by which

“ that portion of the cut crop lying on such part of the said platform ” “ shall be removed laterally towards the ‘ raker ’ and placed among the cut crop lying on the remaining part of such platform.”

2. The second part of the invention “ relates to a mode of obtaining an alteration in the speed of the cutting apparatus,” “ and it consists in placing one or more of the wheels from which the motion of the cutting apparatus is derived on an eccentric shaft or shafts, or equivalent contrivance, so that the distance between the centres of such wheels and the centre of the wheels or pinions into which they gear may be increased or diminished, and consequently the size of the driven wheels or pinions varied.”

3. The third part “ relates to mowing machines in which the cutting apparatus consists of a revolving cutter acting against a fixed blade, and it consists in making such fixed blade with raised or turned up edges both at the back and front sides thereof,” so that when one side is worn the blade can be reversed and the other side brought into use.

[Printed, &c. Drawings.]

A.D. 1864, February 15.—No. 392.

HENSMAN, WILLIAM.—(*Provisional protection only.*)—“ Apparatus used for cultivating land.”

The following is the whole Provisional Specification:—

“ In agricultural implements for tilling land, more especially those working by steam, a number of instruments acting on the land are usually mounted in a framework, parts of which can be raised for lifting the instruments from or lowering them into the ground, and are usually in duplicate sets, one set for acting in a contrary direction to that of the other; and my invention relates to the apparatus for lifting and sustaining the implements from the ground; for this purpose I employ a wheel and pinion to actuate a barrel or shaft (one for each set of instruments) on which the chain or connection lifting the plough frame is wound. On this chain barrel is mounted a disc or drum, on the periphery of which a strap encircling it exerts a sufficient amount of friction to sustain the chain barrel with the weight of the implements in any position. The disc or drum is

" mounted loosely on the axis, and there is adjoining it a  
 " ratchet wheel fixed to the axis; a pawl mounted on the disc  
 " takes into this ratchet wheel which carries the disc with  
 " it when turned in the one direction and causes it to slip in  
 " the brake strap, this it does when lowering the implements,  
 " while, on the other hand, when raising the implements, the  
 " ratchet teeth traverse pass the pawl and so obviate any  
 " friction of the brake surfaces which remain stationary during  
 " this time, thus it is simply necessary to turn the winch  
 " handle by which the gearing is actuated in the one direction  
 " or the other. The implements remain stationary at any  
 " point without fixing. The strap of the brake I apply with  
 " a spring and a screw bearing on it so that it may be tightened  
 " at pleasure in case of wear."

[Printed, &c. No Drawings.]

A.D. 1864, February 17.—No. 413.

HORNSBY, RICHARD, BONNALL, JOHN, and ASTBURY, WILLIAM.—"Agricultural implements."

The improvements relate to ploughs, horse hoes, paring ploughs, drills, &c., and also to agricultural and other engines.

1. A system of ploughing is described. The implement frame carries a drum "to wind up the slack of a light rope, which is employed to connect together two ploughs" "used simultaneously." "The hauling engine traverses along one headland, and a light pulley carriage along the other, the ploughing is always done whilst the ploughs are travelling towards the engine, one plough starts from the further headland and is hauled by the engine for half the distance across the field, it then goes out of work, and another plough, which here meets the first, commences to work, and continues in action until it comes up to the engine. The light rope connecting the two ploughs passes round the pulley of the pulley carriage, so that always whilst one plough is in action, it is drawing the other back to its starting place." Instead of being on the implement frame, the drum above mentioned may be mounted on a separate carriage. The single-action plough used has the beam carrying the tools pivoted on the axle of the bearing wheels, the weight of the

tools being counterpoised by a weight at the other end of the beam, which weight may be the drum for the light rope. The bearing wheels are similar to those described in No. 1726, A.D. 1863. The implement is steered by a toothed segment and worm acting on the bearing wheels. To pulverise the land "forked mould boards" are used, or mould boards which have "slits or openings in them for the earth to pass through."

2. Several improvements in paring ploughs, horse hoes and drills are described. The levers for the coulter, &c., are "of trough-like form." The hoe, coulter, &c., are placed at the extreme end of the lever, the weights and lifting apparatus being inside the hoes, &c. Each lever is clamped to a short tube sliding on the fulcrum bar carrying the levers. The tube can be set any distance apart, as they can be clamped each at any point on any one of the short tubes, which are all threaded close together on the bar. The sockets carrying the stems for the shares, &c. of paring ploughs and horse hoes are "open at the back, and a pin or bolt is used to secure the parts." The share and socket the inventors "press out of sheet steel." The stem is "broader than usual and rounded in front," and the socket is arranged "to make a smooth surface with the stem it fits upon without ridge or step." "This is done in order to prevent weeds hanging on the socket and stem." For drills the coulter stem is formed hollow, and serves as the seed tube. The fulcrum bar is capable of adjustment at either or both ends by means of a lever at each end operated by a screw or otherwise. In horse hoes, where the fulcrum bar is square at the ends where it slides through guides for steering purposes, the end hoes, instead of being mounted on the bar, are mounted on separate short bars carried by arms on the fulcrum bar.

3. Improvements in steam engines are described.

In the Provisional Specification the description varies in some points. The share levers are stated to be mounted on boxes on the fulcrum bar, not on tubes sliding thereon. Also there is a method described of using a telescopic axle-tree, when the axle-tree is cranked to allow the wheels to be set at varying heights.

[Printed, 3s. 2d. Drawings.]



A.D. 1864, February 18.—No. 420.

RANSOME, ROBERT CHARLES. RANSOME, ROBERT JAMES, and RANSOME, JAMES EDWARD.—“Beams, mould boards, and shares of ploughs.”

These are cast of the required forms and afterwards converted by the process of cementation. The beam is by preference hollow, and of a rectangular transverse section. Different parts may be of different degrees of hardness. The mould boards also may be of different degrees of hardness in different parts, this being effected by heating parts and quenching them in sea water (by preference). The cutting edges of the shares are hardened in a similar way. Separate cutting edges also may be employed.

[Printed, 8d. Drawing.]

A.D. 1864, February 26.—No. 477.

JOHNSON, JOHN HENRY.—(*A communication from Eugene Theodore Denis*)—Ploughs.

The improved plough is “reversible” being provided with two bodies, one above and one below the beam, so that they can be brought into action alternately. The front end of the beam is supported on an adjustable upright carried by a pair of wheels. “The draught chain is attached to a hook which runs loose along a semicircular hoop or bow secured laterally to the beam a little in advance of the coulter, and the chain thence passes over the fore axle, and has attached to its front end a long slotted link which runs freely along a metal bow connected rigidly to the front end of the beam and projecting laterally from the side thereof so that on the reversal or turning of the beam before commencing the return or back furrow, the two bows or semicircular hoops will occupy a convenient position for the draught chain.” The plough is turned over by a lever pivotted to the beam. A handle along this lever withdraws a catch which holds the plough in either position.

[Printed, 10d. Drawings.]

A.D. 1864, March 3.—No. 529.

ELLIS, GEORGE HENRY.—“Apparatus for rolling and watering gardens and other kinds of land.”

A small roller has mounted on it a tank of galvanised iron which can be filled with water to give the required weight. A pump with pipes, &c. may be fitted to the tank, or a perforated distributing pipe with stop-cocks so that the apparatus may be employed for watering land as well as rolling it. As the title implies the apparatus is intended chiefly for garden use, but it is also available for other purposes.

[Printed, 8d. Drawings.]

A.D. 1864, March 5.—No. 555.

**GRACE, THEODORE.**—"Hay-making machines."

"The object of these improvements is mainly to dispense  
"with the two cylinders used in double-action hay-making  
"machines, that is in tedding and turning machines. For  
"this purpose the travelling wheels carry toothed driving  
"wheels gearing into pinions which run loose on the rake  
"shaft; on each side of this pinion, and cast with it, is a clutch  
"having a series of inclined faces. A corresponding clutch  
"is fixed on either side of the pinion by a feather which slides  
"to and fro in a slot in the rake shaft, and is kept up to its  
"work by a spring. This arrangement enables the machine  
"to turn freely at the end of the field without either of the  
"driving wheels becoming fixed. By moving the pinion  
"backward or forward upon the shaft it can be geared into  
"the right or left hand clutch, thereby changing the direc-  
"tion of the rakes." In the Provisional Specification the  
following passage occurs, but this part of the invention is dis-  
claimed in the Final as not being new. "The radial arms  
"which carry the rake bars are fitted with square-headed  
"sockets at their outer ends to which the rake bars are  
"jointed, and are held in position by springs pressing on the  
"squares of the socket; or the rake bars are affixed to the  
"radial arms by means of indented cams kept in contact by a  
"spring, the yielding of which allows the required change of  
"position when the rakes are to be thrown out of action."  
The rake shaft and pinions may be mounted on the main  
framing, or on an "inner frame" so pivotted that it may rise  
and fall with inequalities of the ground.

[Printed, 10d. Drawings.]

A.D. 1864, March 7. —No. 564.

BACKHOUSE, JAMES.—(*Provisional protection only.*)—"Ma-  
chinery for reaping corn."

The following is the whole Provisional Specification —

"In constructing my improved reaping machine I leave a  
sufficient space between the corn table and the driving  
wheel to deliver the swathe, and I place the knife bar in  
front of the driving wheel, and drive the knife also in front  
of the driving wheel; thus leaving the entire machine full  
liberty to play over the axle of the driving wheels. I also  
place two leading wheels before the knife (one on each side  
of it) to prevent it from running into the ground. In work-  
ing this machine the horses walk in front thereof along the  
side of the standing corn, the driver being seated on the  
machine and having under his control a lever, by means of  
which he can turn the swathe to any suitable angle at his  
own discretion, the swathe being laid (as above stated)  
betwixt the driving wheel and the corn table, which are  
placed directly opposite to each other."

[Printed, &c. No Drawings.]

A.D. 1864, March 10.—No. 602.

WALLACE, JOHN.—(*Provisional protection only.*)—"Reaping  
machines."

The following is the whole Provisional Specification :—

"This invention comprises various improvements in reaping  
machines and relating to the draught details, to the delivery  
arrangements, and to the cutting knife. In a modification  
embodying the improvements relating to the draught a  
wooden bar is connected by metal framing to the gland  
or bow of the swivelling fore wheel, and to this bar are  
jointed or hooked the chain traces for one or two horses.  
Each breeching is connected to the traces on either side  
and a tube is put over the chain trace so as to extend from  
the breeching connection back to the bar. Or instead of  
the tube a long link or rod may be substituted for the chain  
at that part of the traces. The tubes or rods enable the  
horse to back the machine without side poles. The im-  
provement in the delivery consists in employing a self-  
acting tilting board which receives the cut crop, and instead  
of merely oscillating makes a complete half turn at suitable

“ intervals. The board may be driven directly from the axle  
“ of the driving wheel or wheels, such axle having fixed on  
“ it a wheel with teeth on only a portion or portion of its  
“ circumference and gearing with a toothed wheel on the  
“ spindle of the board. The improvements relating to the  
“ cutting knife consist in attaching the knife plates to the  
“ knife bar so as to overhang the inner side thereof, and in  
“ placing bars across the fingers for the under side of the  
“ knife plates themselves to rest and work upon, and without  
“ the bottom of the knife bar touching the fingers, the object  
“ being to make more sure of the knife working close down  
“ upon the fingers. The inner edge of the knife may be  
“ arranged to work close against the finger bar, or a small  
“ space may be left for matters to drop through.”

[Printed, 4d. No Drawings.]

A.D. 1864, March 14.—No. 648.

HENSMAN, WILLIAM.—“ Apparatus for raising and lowering  
“ weights, applicable among other purposes to agricultural  
“ implements.”

The invention is applicable to various purposes. The method of its application to agricultural implements is described as follows:—The improvements are applied to implements for tilling land which have one set of tools in action, and another raised above the land. The chain lifting the plough frame, &c. is wound on a barrel operated by means of a wheel and pinion; “ on the pinion shaft, or if preferred on  
“ the chain barrel or shaft, is mounted a disc or drum on the  
“ periphery of which a strap encircling it exerts a sufficient  
“ amount of friction to sustain the chain barrel with the  
“ weight of the implements in any position. The disc or  
“ drum is mounted loosely on the axis or ratchet, but there is  
“ adjoining it a ratchet wheel fixed to the axis; a pawl  
“ mounted on the disc takes into this ratchet wheel, which  
“ carries the disc with it when turned in the one direction,  
“ causing it to slip in the brake strap; this it does when  
“ lowering the implements, while on the other hand, while  
“ raising the implements, the ratchet teeth traverse past the  
“ pawl.” The brake strap is fitted with a spring and a tightening screw.

[Printed, 1s. Drawings.]

# AGRICULTURE.

A.D. 1864, March 15.—No. 650.

W. E. BENJAMIN.—(A communication from Louis Adam.)—  
*Patent protection only.*—"Machine for mowing grass or  
 cutting grain."

Following is the whole Provisional Specification:—  
 "This invention consists of an iron frame mounted on  
 wheels, and furnished with suitable bearings for supporting  
 an upright shaft, upon the lower end whereof a circular  
 disc or plate of metal is fixed, and carries about its periphery  
 a series of plates somewhat resembling a circular screw:  
 this plate is caused to revolve by bevelled gearing driven  
 by the hindmost running wheels of the machine as they  
 rotate by being drawn along the surface of the ground.  
 "The aforesaid disc or plate revolves between two quadrant-  
 shaped pieces of metal fixed to the framing of the machine.  
 "The lowermost of said quadrant pieces carries at its per-  
 phery curved prongs or rake teeth, which are employed to  
 collect the grass or straw of the grain and direct it to the  
 cutter. The edge of the uppermost of the aforesaid quad-  
 rant pieces is formed serrated so that as the machine is  
 advanced the revolving serrated disc plate cuts the grass or  
 straw held between the curved prongs and serrated edges of  
 the uppermost quadrant piece. In order to collect the cut  
 grass or straw and deliver same at the side of the machine  
 I employ a series of radial arms in sets, say four sets, fixed  
 at about equal distances one above the other upon the afore-  
 mentioned upright shaft. I also fix to the framing of the  
 machine two curved vertical skeleton guides; one of said  
 guide extends from the back part of the machine nearly in a  
 line with the centre thereof, thence it passes in a curved  
 direction behind the upright shaft aforesaid, and extends  
 foot or more beyond the side of the machine, nearly in a  
 line with the centre of the aforesaid shaft. Each set of  
 radial arms aforesaid passes between the spaces of the  
 skeleton guides above mentioned, and thus push the  
 grass or straw along the curved channel formed by the  
 guides, and deposit same on the ground at the side of  
 the machine."

[Printed, &c. No Drawings.]

A.D. 1864, March 16.—No. 669.

FONTAINEMOREAU, PETER ARMAND le Comte de.—(*A communication from Henry Place.*)—(*Provisional protection not allowed.*)—"Rendering useful the enclosures of railways."

The following is the whole Provisional Specification:—

"The invention communicated to me consists in setting on each side of railways, wooden or metal posts at certain distances apart, and connecting or uniting them by iron wire or lattice work. On the ground of such enclosures, I plant fruit trees or productive creeping plants, the species of which varies according to the soil, climate, and wants of the country. The stems and branches of the trees and plants are tied to the wire or latticework already existing, but in this case, they are horizontally connected together by limbs or other suitable means of meeting them. By this invention such enclosures are rendered productive and when fully grown, present an insurmountable barrier."

[Printed, *ad.* No Drawings.]

A.D. 1864, March 17.—No. 683.

JARMAN, JOHN, and SHARPE, STEPHEN.—(*Provisional protection only.*)—"Construction of steam ploughs."

The following is the whole Provisional Specification:—

"We propose to work a plough or series of ploughs connected to a locomotive engine, travelling over the land on wheels suitably constructed to obtain sufficient grip; clutches upon the axle of the driving wheels, and levers upon the engine frame provide the means of putting the driving wheels into or out of gear, the wheels being driven by a toothed wheel upon their axle engaging in a pinion upon the crank axle. The ploughs may be Howard's or of any other suitable kind, mounted in a frame at the tail of the locomotive, and they are fitted with lever and link connections by which they may be raised out of the earth or adjusted to plough to any required depth, or suspended whilst turning the engine, and afterwards lowered for work. We also construct a driving wheel by which we can obtain great fulcrum power, by forming iron drags or spurs, fitting on the driving wheels in slots and made to work so as to hold themselves on, which drags or spurs can be removed from



" the wheels if not required, or these drags or spurs may be fitted on the side of the wheel."

[Printed, 4d. No Drawings.]

A.D. 1864, March 22.—No. 726.

BARBER, DAVID HENRY.—"Reaping and mowing machines."

The following are enumerated as the improvements:—

1 "Sustaining the backward pressure of "the finger bar" by using a bar "rigidly attached to the main shoe, which "extends backwards between the driving wheels to the rear "corner of the main framing, where it is connected to a lug or "bracket by means of a swivel box, in which "the rear end "of the main shoe is free to rock," so as to allow the bar to adapt itself to the ground. The box can be adjusted to any height.

2. "Setting the finger bar forward to compensate for its "backward deflection by usage." For this "an adjustable "lateral brace rod is employed attached at one end to the fore "part of the shoe, whilst its opposite end passes through the "side of the main framing, and is then tightened up by a "nut "

3. "Elevating either or both ends of the finger bar," or raising it upright for transport, by a "single hand lever in "connection with a segmental rack chain and foot rack, the "two racks operating in combination with each other or "separately." "The object of the foot rack is to hold down "the main shoe, whilst the point of the finger bar is elevated "by the segmental rack and chain. In combination with "this apparatus, a spring bar is employed for holding the "foot rack out of gear when not in use, thus permitting the "finger bar to rise and fall freely."

4. "Elevating or depressing the points of the guards." For this purpose, there are two frames hinged together and connected by a curved bar with holes for pins. The draught is attached to one frame, and the gearing, &c. carried by the other, which can accordingly be raised and held at any height.

5. "Connecting the end of the connecting rod with the "sickle" by means of a block to which they are hinged.

6. "Releasing the finger bar when raised, and depositing it "on the ground by the aid of the foot alone of the driver, "which is to be brought in contact with one end of a hori-

" zontal foot lever acted upon in the opposite direction by a  
 " spiral or other spring." " This lever serves as a detent by  
 " engaging into the teeth of the segmental rack ;" whence it  
 is released by the driver's foot.

7. Working the clutch for throwing the apparatus out of  
 gear. For this purpose there is "an upright hand lever, to  
 " which is attached a rod connected to a disc carrying a hori-  
 " zontal cam surface, and working on a fixed centre." " This  
 " cam surface operates upon one end of a lever, the other end  
 " of which is forked to engage with an ordinary sliding clutch  
 " box on the transverse driving shaft," " which is held in  
 " gear with a bevel wheel on the driving shaft by the pressure  
 " of a spiral spring on the opposite side of the clutch  
 " lever." Or "both the pinions may be drawn out of gear  
 " from the spur wheels" of the bearing wheels by "sliding  
 " rods actuated by a wedge or incline moved by the upright  
 " hand lever."

8. Attaching an adjustable plate to "the track board, which  
 " plate carries the separating handles, so that they may be  
 " raised or lowered as required."

9. Using "a supporting pin in the main shoe to prevent  
 " the sickle from dropping down when the finger bar is in  
 " an upright position."

10. Using a "peculiar clip piece for keeping the sickle in  
 " its proper position." " It is constructed with two lugs  
 " extending back to a shoulder on the main shoe to which it  
 " is firmly bolted."

The following also appear in the Provisional, but not in the  
 Final Specification.

11. " Preventing the sickle from acting when the machine  
 " is moved backwards." This is effected by the use of pulls  
 and ratchets on the pinions of the driving shaft.

12. " Counteracting side draught." A perforated horizontal  
 segment piece is fixed to the frame. "To the centre from  
 " which this segment is struck is pivoted a horizontal lever  
 " which is free to travel over the surface of the segment," but  
 is fixed by a pin. "To this end of the lever is attached at its  
 " centre a 'double tree,' which point of attachment is in all  
 " cases the line of draught of the machine."

[Printed, 1s. 6d. Drawings]

A.D. 1864, April 1.—No. 818.

MACRAE, ARCHIBALD.—(*Provisional protection only.*)—"Apparatus to be employed for tilling and cultivating land."

The implement is to be worked by a traction rope and steam engine. Grubber teeth are mounted in a frame pivotted to the main frame of the implement, and capable of being raised and lowered by a screw. Behind these is a set of revolving tines on a shaft rotated by the traction rope, which is double, and passes round a pulley on the frame. There are two pulleys, and two ropes, one for drawing the implement in each direction. These pulleys can either run free on their shaft, or be clutched thereto, so as to cause it to rotate and enable motion to be given to the tine shaft above mentioned. The frame is supported in front by a pair of rollers, and there is also a pair of castor wheels on which it is supported for turning, the castor wheels being mounted so that they can be raised and lowered as required. The hinder part of the frame is supported on a pair of rollers fitted with spikes which serve to clear the revolving tines.

[Printed, &c. No Drawings.]

A.D. 1864, April 12.—No. 915.

PETERS, MATTHEW LANGTREE and HABKES, WILLIAM.—"Machinery for mowing and reaping."

"This invention consists, first in placing the cutters in a line with the axis of the driving wheel, instead of placing them either before or behind." "Secondly in connecting the shafts for the horse and the seat of the driver to a swivel frame connected to a centre stud in the main frame of the machine, for enabling the machine to be worked alternately to and fro across the field, and in locking the same with self-acting catches. Thirdly, in making double cutters with knife edges at each edge of the blade, and in making guides through which the cutters work to project on both sides of the blade. Fourthly, in supporting the cutters on a frame, which frame is acted upon, when required, from both sides of the machine, by two treadles and levers to enable the driver to raise or lower the cutters when necessary." "When the machine is used for reaping, the platform

“ for the attendant who rakes up the corn is swivelled over  
“ and turned round with the shafts,” &c.

[Printed, 10d. Drawings.]

A.D. 1864, April 12.—No. 916.

ALLIOTT, JAMES BINGHAM.—(*Provisional protection only*).—  
Ploughs.

The following is the whole Provisional Specification:—

“ This invention consists in the employment of a disc re-  
“ volving freely on an axle fastened to the framework of  
“ the plough. This disc takes the place of the breast of the  
“ plough, and is fixed at a suitable angle to the beam so as to  
“ force the earth to the required distance, and turn it over,  
“ and as the disc revolves in passing through the earth, the  
“ power required to work the plough is considerably reduced.  
“ Also in the use of a disc (or discs) revolving freely on an  
“ axle fastened to the frame of the plough on the opposite  
“ side to the first-mentioned disc. These improvements may  
“ be applied to ploughs worked by steam, horse, or other  
“ power.”

[Printed, 4d. No Drawings.]

A.D. 1864, April 13.—No. 934.

COPE, JAMES.—“ Apparatus employed for steam ploughing.”

The improvements ad refer to agricultural engines, but amongst them is included a special description of anchor by which the engine can be secured in its place. This consists of a disc so mounted that it can be caused to rotate and thus cut its way into the ground. It may be mounted in bearings at the end of a lever, or in a rocking frame, motion being given to its spindle by a pulley thereon and an endless band from the engine or otherwise. It may also be mounted on the frame of the engine, on the axle of the running wheels, &c.

[Printed, 1s. 10d. Drawings.]

A.D. 1864, April 16.—No. 960.

PRIEST, ALFRED and WOOLNOUGH, WILLIAM, the younger.  
—“ Machinery for hoeing land.”

Improvements on No. 19, A.D. 1856, and No. 1735, A.D. 1861.

## AGRICULTURE.

" The present invention consists of providing two horizontal  
" bars for the hoe levers to be mounted on. These bars are  
" suspended at each end from two friction rollers, which  
" resting on iron tramways have liberty to move laterally or  
" sideways to admit of the hoes or cutting blades being  
" guided between the rows of plants. These tramways are  
" fixed to iron standards which pass through the side frames  
" of the implement, and are acted on by lever handles, so that  
" while either end of the horizontal bars may be raised or  
" lowered as required, adjusting the hoes to the surface of the  
" ground, the rollers from which they are suspended, at what-  
" ever inclination the two bars and hoes may be, always move  
" laterally on horizontal planes. The two horizontal bars are  
" kept asunder by an iron stay at each end, which stays  
" carry a third friction roller working horizontally between  
" the other two, so as to sustain the resistance of the levers  
" and hoes when working in the land. The hoe levers are all  
" made of equal length, and mounted alternately on the two  
" horizontal bars, so that all the hoes have an equal pressure  
" on them, and are thus made to cut the ground a regular  
" and uniform depth, at the same time allowing plenty of  
" space for weeds or stones to pass between them."

[Printed, 10d. Drawings.]

A.D. 1864, April 23.—No. 1032.

SMYTH, JAMES JOSIAH.—" Drills to sow or deposit corn, seed  
" and manure."

Each coulter lever is connected by a chain to a transverse  
roller on which the chains from all the levers are wound. An  
upright stem from the lever has also a chain from it to the  
roller, and these chains are wound on the roller in the opposite  
direction. Thus by turning the roller the coulters are raised  
or depressed. This is effected by a worm and worm wheel,  
the handle of which can be locked in any desired position by a  
catch.

The seed tubes are telescopic, the upper part sliding within  
the lower. The joint is covered by a tube which fits close  
against a flange at the top of the upper tube, and is held up to  
the nozzle of the seed box by springs or chains. The bottom  
of the lower tube is supported by "a conical socket which fits  
" on to a hollow metal ball" "the stem of which passes

" through an eye in the lever " of the coulter, " and is there  
" secured by a set screw." "The hollow stem of the ball  
" enters between the cheek plates of the coulter, which spring  
" in and clip it closely." The object of the whole arrangement  
is to keep dirt from entering and clogging the passages.

[Printed, 1s 4d. Drawings.]

A.D. 1864, May 3.—No. 1117.

GARRETT, RICHARD, junior.—(*Provisional protection only*).—

" Machinery applicable to steam cultivation."

The improvements relate to implements in which the plough frames are mounted separately at opposite ends of the carriage. The frames are jointed to arms keyed to one of a pair of transverse rock shafts. Each shaft has on it a lever, the end of which is connected by a short rope to the traction rope. The tension of the traction rope, acting through the short rope, raises the set of ploughs not in use out of the ground. These are held up by a ratchet wheel which is released by hand. This wheel may also be used to raise the set of ploughs from the ground by hand. The carriage is steered by a chain, the ends of which are " attached to a kind of tiller, the motion " of which is communicated to the axles of the carrying " wheels." The chain is operated by a pulley at each end of the carriage, over which it is passed, these pulleys being turned by a hand wheel.

[Printed, 4d. No Drawings.]

A.D. 1864, May 6.—No. 1153.

TOMLINSON, JOHN.—(*Provisional protection only*).—"Apply-

" ing motive-power to the traction of omnibuses or other  
" vehicles travelling upon highways or roads, the same being  
" also applicable to ploughs or other agricultural implements  
" working upon land or roads."

A steam omnibus is described the body of which is mounted in a particular manner intended to keep it level when going up or down hill. There does not appear to be any portion of the invention specially applicable to agricultural implements, and no further allusion is made to them except that quoted above in the title.

[Printed, 4d. No Drawings.]



A.D. 1864, May 11.—No. 1189

MOORE, JOSEPH.—(*Provisional protection only.*)—"Machines for reaping and mowing."

The following is the whole Provisional Specification.—

"The nature of my invention consists in making the knives or cutting tools of reaping and mowing machines into an endless chain of links passing around toothed or other wheels, to one of which rotary motion is given by an internal wheel on the driving wheel; this internal wheel gears into a pinion on a horizontal shaft which, by means of a pair of mitre or bevil pinions drives the upright shaft to which the driving toothed wheel of the endless chain of cutters is fixed; this upright shaft is provided below with a universal joint to enable the angle of the cutters to be varied, near the outer extremity of the endless chain of cutters is a small travelling wheel bearing on the ground to give steadiness to the frame supporting the outer wheel around which the endless chain of cutters passes. The speed of the chain of cutters can be varied by changing the wheels or pinions by which motion is communicated to it, and the cutters can be thrown out of gear when requisite by means of a clutch or grooved pinion. The frame supporting the endless chain of cutters is provided with stationary guards as in machines furnished with vibrating knives. I wish to remark that although I have described the chain of cutters as put together with links to form an endless chain, I do not limit myself to this peculiar mode of construction, as endless cutters may be constructed in various other ways, all of which I consider as forming part of my invention."

Printed, &c. No Drawings.

A.D. 1864, May 17.—No. 1235.

SOVEREIGN, LEVI LEMON.—"Implement for cultivating land and for sowing seed."

Two implements are described, one is a combined plough and drill, the other a cultivator.

The plough can be used either with steam or horse power. The plough bodies are mounted on a suitable frame supported on a pair of large wheels in front, and a pair of small wheels behind. A seed box is mounted on the frame and with

is a revolving shaft, driven from the front bearing wheels by a chain and a pair of mitre pinions. Stirrers on this shaft agitate the seed, which passes down tubes leading to the furrows. The ends of these tubes are closed by slotted discs, which are revolved by cords from the stirrer shaft so as alternately to open and close the mouth of the tube and thus deposit the seed at intervals. At each end of the frame is a lever for raising the frame. By raising the front end, the apparatus is thrown out of gear, and the delivery of the seed stopped. The point of the shares can be raised and lowered by a rod with an adjusting nut thereon. In working this implement by steam, steering apparatus is used, and a wheel and quadrant is employed for raising and lowering the frame. The inventor says, "when working by steam power I use two of these implements and fit a reel upon each round which a loose length of cord is wound. This reel is free to turn for winding in and letting out the cord or chain as required, and is fixed by a ratchet and foot spring pawl; I connect the two implements by the reel cord which passes round the anchor pulley at one side of the field, and at the opposite side I place and work the engine and attach the two ends of the hauling cord or rope passing round the engine drum to the said implements." "For raising the implements at the headlands I attach a clip rope to the hauling rope and cord, this clip rope or chain upon being drawn then lifts the implement out of work."

In the cultivator described, the main bearing wheels are not side by side, but one is in advance of the other.

"These wheels are coupled to the frame" "by means of swivel joints." The pole is swivelled on a cross bar in front of the frame, and is described as "working in" a second cross bar behind. There is a "centre swivel wheel" at the back for adjusting the height of the implement.

A harrow may be connected with one of the above implements. This harrow has "a number of loose bosses on a spindle" and these are fitted with hooked teeth "and are so arranged on the shaft that as one set of prongs or teeth is in work, another is sliding on the ground in front, while a third is above the shaft." The teeth thus yield on meeting an obstruction and clogging is avoided.

[Printed, 2s. 4d. Drawings.]

A.D. 1864, May 17.—No. 1240.

FLETCHER, JOHN.—“Reaping and mowing machines.”

The invention “relates to that part of reaping and mowing machines known as the ‘fingers’ or knife-guides and consists in fitting a piece of steel into one or both sides or surfaces of the slot in each finger or guide so that the knife will work in contact with such steel mouth-piece or pieces, whereby a better cutting action is obtained, as the steel edges are less liable to be injured or blunted by stones or grit than when a softer metal is employed.”

[Printed, *6d.* Drawing.]

A D. 1864, May 19.—No. 1268.

SARGEANT, WILLIAM. — (*Provisional protection only*) — “Horse-hoes and seed drills.

The improvements relate to the carriages of such implements. The fore part of the carriage is mounted “upon wheels at each side, capable of being controlled” “by suitable steering apparatus actuated from the hinder part of the carriage.” These wheels are carried by adjustable standards from which levers are carried back to a cross bar for guiding the implement. The hind part of the carriage is supported on a single wheel or pair of wheels, and this may either be left free to follow the direction of the carriage or be fixed by a pin. For purposes of transport, shafts are fitted to the hinder part of the frame.

[Printed, *4d.* No Drawings.]

A.D. 1864, May 20.—No. 1275

DICKSON, SAMUEL ROBERT — Ploughs

The share of the plough consists of a screw with three or more blades, pointed at its end. This screw is mounted on the end of a shaft pivotted to the rear of the plough-beam, and inclining forward below it. A segment mounted on the shaft and capable of being fixed to the beam at any height by a screw, enables the share to be raised and lowered. The shaft is mounted in bearings so as to be capable of rotation, and it is rotated by a suitable arrangement of gearing and shafting from one of the front wheels of the plough. The hinder end

of the beam is supported by a swivel wheel. The plough may be worked by horse, steam, or other power

[Printed, 1s. Drawings.]

A.D. 1864, May 28.—No. 1326.

DICKSON, JAMES.—“ Harrows applicable to cleaning green crops growing on drills or ridges, and other purposes.”

The implement consists of several small harrows so connected that they may work between the drills. As figured in the drawing the frame of each harrow is formed like an elongated figure 8. Two or four of these are used at once. They are jointed by arms to steering handles above in such a way that they can be set at any distance apart or at any inclination. They are attached by chains to a whipple-tree in front by which they are drawn. To render the implement available as an ordinary harrow, additional harrow frames are fitted in between the others.

[Printed, 3d. Drawings.]

A.D. 1864, May 30.—No. 1338.

HALL, COLLINSON.—“ Improvements in ploughs and in machinery or apparatus for working the same and other agricultural implements by steam.”

1. Method of raising ploughs out of action at the end of the bout. The end of the frame carrying each set of ploughs has a chain affixed thereto which is led over a pulley on the top of an upright on the main frame. The chain is then led under a second pulley and attached to a quadrant to which is affixed a lever having at its opposite end a short chain. By hauling on this chain the plough frame, which is fitted to slide in suitable guides, is raised. The plough frame can be held at any required height by screws. Two implements are to be used with one engine and anchor, or with two engines.

2. Method of “ bringing the power of two or more engines to bear on and drive one sectional winding or propelling drum.”

3. Construction of a portable railroad, and application of the same to agricultural engines.

4. Rope porters which “ travel with the chain or rope.” These consist of a frame mounted on two pair of wheels. At

the middle of the frame is a clip for holding the rope. This is opened by a projecting rod striking the anchor or engine. The clip can also be opened by hand by means of a trigger. The beam of the apparatus is jointed, "to allow of the axles of the two pairs of wheels being fixed at a slight incline to each other, but still in the same horizontal plane, whereby the porter has a tendency to travel out of the direct line of draught."

[Printed, 1s. 2d. Drawings.]

A.D. 1864, June 3.—No. 1361.

HEAL, JAMES BLACKMORE. — (*Provisional protection only*). —  
"Apparatus for drilling or depositing turnip and other seeds  
and manure."

The apparatus forms an addition to the ordinary drilling machine and "consists principally of a series of hoppers or funnels for catching the seed as it falls from the pipes of the drill above, and holding it until it arrives at a given point, when a valve opens at the bottom of the funnel and instantly drops the seed contained in it. The orifices at the lower or smaller ends of these hoppers or funnels are closed by a series of fingers which act as valves for opening and closing the orifices. These fingers are all attached to a shaft or spindle running across the machine, and an intermittent oscillating motion is given to this shaft at intervals by means of a tappet or tappets on a revolving shaft, so as to remove the fingers from the orifices of the hoppers or funnels at regular intervals, the fingers being returned immediately and the orifices closed by means of a spring or springs as soon as they are released by the tappets. The revolving shaft is actuated by wheels upon each end thereof, which run upon the land." "The apparatus is fastened under the drill a little in front of the manure box;" "there is a joint immediately behind the point at which it is fastened, so as to allow the other end of the apparatus to rise or fall according to the unevenness of the land." By attaching similar funnels below the manure box, having slides or valves connected to the same oscillating shaft, the manure may also be deposited (if required) in heaps in the exact spot where the next bunch of seed will fall."

[Printed, 4d. No Drawings.]

A.D. 1864, June 6.—No. 1407.

AVELING, THOMAS, and LAKE, THOMAS.—"Apparatus to be used in steam cultivation."

The invention refers to rope porters. These are made to travel with the rope. The apparatus consists of a pair of wheels carrying a beam supported at right angles to the axle, which is cranked. The beam is free to work up and down. One end is furnished with a handle, and the other with a hook by which the rope may be caught up from the ground. There is also a V-shaped piece which assists in holding the rope. At the handle end of the beam is a guide through which the rope is led. This guide is formed of two collars, one rotating within the other, and the two having each a slot. By bringing the slots opposite, the rope is admitted into the guide, and by turning one round the rope is secured. To cause it to travel out of the straight line, and off the ploughed land, there is a bar by which the angle of the axle and beam can be altered.

[Printed, 8d. Drawing.]

A.D. 1864, June 8.—No. 1425.

RICHARDS, THOMAS.—"Liquid manure and water carts."

The cart is cylindrical, mounted on a horizontal axis and supported by a pair of wheels. The cart is filled through an opening in the top by means of a pump, and discharges through an opening at the centre of one of its ends. In order that the whole of the liquid may be discharged there is a partition extending radially along the cylinder from its circumference a little beyond the axis. As soon as the level of the liquid has fallen below the axis, the cylinder is rotated on the axis, and the liquid is thus elevated by the partition to the level of the central opening, and discharged therethrough. The rotation of the barrel is effected by a worm and toothed circle on the face of the end of the barrel, or otherwise.

The object of this arrangement is to allow the weight to be carried low down, while the liquid is delivered at a convenient height.

[Printed, 8d. Drawing.]



A.D. 1864, June 15.—No. 1483.

ELLISSEN, ADOLF. —(*Provisional protection only*).—"Means  
" of cultivating land in order to increase the productive power  
" thereof "

The following is the whole Provisional Specification:—

" I place in the earth a series of plates of copper and plates  
" of zinc connected together by wires so as to form either a  
" galvanic battery or a number of single elements, or I use  
" plates of carbon and zinc or any of the elements of a  
" galvanic battery. The object of my invention being to  
" improve the productive power of the soil by applying the  
" action of galvanism and electricity as fertilizers "

[Printed, *ad.* No Drawings.]

A.D. 1864, June 27.—No. 1610.

STEEVENS, WILLIAM. —(*Provisional protection only*).—"Carts,  
" conveyances, and waggons for commercial, agricultural,  
" and military purposes."

The axle is placed "through the body" of the vehicle, so as  
to carry the weight "below instead of (as heretofore) above"  
The front part "of the body is so arranged that the horse is  
" brought back close to the axle, with covered space over  
" his back so that the weight is evenly balanced when laden."  
" The shafts being placed through the body carries the weight  
" and does away with traces, the horses pulling direct from  
" the shaft." To prevent the horse running away, a strap or  
wire rope coiled round the axle is attached to the bit, so that  
the revolution of the wheel rolls up the cord and throws the  
horse back on his haunches. "In constructing carts and  
" waggons for agricultural purposes" the inventor proposes to  
" lessen the draught by using high wheels and placing the  
" axle as above through the body and bringing the bottom  
" framing to carry the weight below. In the case of using  
" springs they are fixed inside, thereby giving more width and  
" space for goods. The horse is brought back close to the  
" axle of the cart, and the body so arranged that the weight  
" is equally balanced with a heavy load. The waggons have  
" also much higher wheels. The hind axle is placed through  
" the body and the springs inside." "The body of the  
" waggon is made much lighter" "by iron slides at the back"

" The market cart is much lighter in draught, the weight  
" being properly equalized, the axle passed through the body  
" under the seat, and the horse brought back close. In the  
" water or liquid manure carts the tanks or body is placed  
" under the axle and brought round the horse so as to carry  
" more water and less draught, with perforated pipes placed  
" at the sides and end."

[Printed, 4d. No Drawings.]

A.D. 1864, June 29.—No. 1626.

CLARK, WILLIAM.—(*A communication from Aristide Paul Blouhet.*)—(*Provisional protection only.*)—" Application of  
" steam power to the cultivation of land."

The greater part of the Provisional Specification refers to the construction of the engine, which is so arranged as to be capable of alternately moving forward and drawing the implement up to it. The implement is connected to the engine by a rope wound on a drum. While the engine is moving forward, the drum runs free and allows the rope to be unwound; as soon as the forward motion of the engine is stopped the drum is thrown into gear and winds the implement up to the engine. To prevent the engine from running back there is an anchor blade mounted behind it, which is driven into the ground by the backward drag of the rope.

[Printed, 1s. 8d. Drawings.]

A.D. 1864, July 6.—No. 1682.

SPENCER, JOHN.—" Machinery for planting potatoes."

A grooved wheel is mounted between swinging arms pivotted to the axle of the carrying wheels of a suitable carriage. At intervals in the groove are cups of a size to receive a potato. By means of small moveable cups the capacity of these can be varied. In front of and above this wheel, supported on its axle, is a hopper, the lower part of which is curved to correspond with the rim of the wheel. A roller, at the upper part of this hopper fits in the groove of the wheel and runs in a direction opposite to that of the wheel, to keep back the potatoes that are not received in the cups. In front of the hopper is a shield fitting over the wheel and reaching nearly to the ground, so as to keep the potatoes in the cups until

they are brought to the spot where they are to be deposited. A second hopper at the top of the machine supplies the first through an opening regulated by a slide. In front of this is a hopper which delivers guano, &c. through a shoot to the furrow. In front of the grooved wheel is a presser wheel, over it is a scraper, and behind it a share to cover in the potatoes.

[Printed, 10d. Drawing.]

A. D. 1864, July 7.—No 1687.

CRICHLEY, HENRY—(*A communication from Robert Dalington*)—"Reaping and mowing machines."

The reel has four vanes and an arm carrying a rake, this arm being mounted on a sliding piece on the reel shaft. Rotary motion is given to the reel by a pinion on a vertical shaft engaging with the teeth of a rack on a sliding horizontal shaft fitted on the end of the reel shaft. This rack is so formed that as the shaft revolves, it is slidden to and fro. This to-and-fro motion is communicated to the piece carrying the rake arm so that as the rake is brought over the platform at each revolution it is also caused to sweep sideways across it. The arrangement as above described may be slightly modified.

[Printed, 2s. 3d. Drawings.]

A. D. 1864, July 8.—No. 1697

BAMLETT, ADAM CARLISLE—"Reaping and mowing machines."

1. To regulate the cutting height the finger bar is attached to the frame by "a double hinge joint" and the pole pivoted to the axle "the small wheel next the standing corn being held in position by a corrugated or toothed washer and bolt." "The machine is provided with levers (or their equivalents) for regulating the cutting height of the knife, "one lever attached to the frame regulates the cutting height when mowing, the other lever being attached to the finger bar raises it from the ground to enable it to pass over the cut grass when mowing, and both levers are or may be used "to regulate the cutting height when reaping, one lever acting on one end of the finger bar and the other lever acting on the other end."

2 The pole is made to slide on the axle and is held in position by screws in order to give more room for the horses between the pole and the standing corn when the machine is used as a reaper.

3. The delivery platform is hinged to the finger bar as described in No. 1468, A.D. 1860, and has "a fence or shield to prevent the corn from falling on to the small wheel next the standing corn; on this fence is formed or fixed a rail or bar at about right angles with the finger bar and inclined upwards."

4. "To keep dust and dirt from the bearing" there is "on the first motion pinion a bell-shaped flange; the driving wheel cover is fitted to this flange"

5 To deliver the cut crop in sheaves at the side, there is in suitable bearings on the reel shaft a delivering rake which rotates with the reel shaft, but being provided with rollers which are acted on by cams fixed on the framework or reel post, and cause the rake to sweep across the platform (the latter being curved to suit the sweep of the rake) thus delivering the cut crop, one cam causing the rake to sweep across the platform, another cam bringing the rake again into position. Now to cause this rake to deliver sheaves at different distances that the machine may have travelled over, the bearings of the rake may be fitted loosely on the reel shaft, and are caused to revolve with the reel shaft by a clutch movement; when the clutch is withdrawn the rake will be stationary for one revolution of the reel, or for half a revolution."

[Printed, 10d. Drawing.]

A.D. 1864, July 11.—No. 1722.

AMIES, THOMAS, BARFORD, WILLIAM. and POPE, EDWARD.  
—(*Provisional protection only.*)—"Rollers used for rolling grass and other lands and roads."

The invention consists in forming the roller frame so that the shaft or pole "may be turned and enable the roller to be drawn back over the same land or in a line near thereto without turning the roller." The roller is mounted in a frame over which is fitted a second frame carrying the shafts. The upper frame can rotate on the lower one, a ring thereon

sitting on a ring on the lower frame, and friction rollers being used if necessary. The frames are fastened together by a pair of bolts which are raised when the roller is to be turned.

[Printed, 4d. No Drawings.]

A.D. 1864, July 12.—No. 1738.

WOOD, WILLIAM.—(*Provisional protection only*)—"Warping" or covering land, bog or peat with earth or soil."

Improvements on No. 1762, A D 1863

The invention relates to apparatus for gathering, &c. the earthy matters, and mixing them with water "A dredging" or endless or scraping and lifting apparatus, or suitable "scoop wheel or revolving screw" is used "to lift the earthy" matters into a holder, where they are mixed with a suitable "quantity of water, and then pumped on the land" Or "the earthy matters are deposited in a hopper, from which" they are removed continuously in measured quantity by a "working wheel or screw into the mixing holder," &c. The lifting apparatus may be attached to a locomotive engine travelling on a tramway or otherwise over the land whence the soil is to be taken. Or if the land is covered with water, the apparatus may be placed in a boat. For the same purpose the land may be embanked and flooded. The soil also can be stirred up so as to mix with the water over it, and pumped up through perforated pipes. The soil can also be raised into the holder by "a species of plough or inclined plane" "being" "pushed or drawn through the soil." A scraper or brush may be used to carry the soil up the inclined plane, and the soil may be passed through a sieve.

[Printed, 4d. No Drawings.]

A.D. 1864, July 14.—No. 1764

TURNER, FREDERICK WILLIAM.—"Implements for cultivating" the soil."

1 In two-way implements the set of ploughs, &c which is in work is secured from lifting by "suspending the frames or" "beams of such ploughs or instruments to suitable links or" "levers connected to the framing in such manner as to allow" "them a certain amount of motion horizontally and longi-  
tudinally while the framing to which the travelling wheels

“ are attached remains stationary ; or the ends of the beams  
 “ may slide in suitable horizontal guides formed in the framing.  
 “ By these means the set of instruments in work have a considerable preponderance over the set which are out of work,  
 “ and so throws them completely out of balance.”

2. Four bearing wheels are disposed “ in such manner that  
 “ the axis of leading wheel becomes the fulcrum should the  
 “ ploughs or instruments lift when in work ; also in such  
 “ manner that when in work four wheels shall bear upon the  
 “ ground, but when out of work two only of the four shall  
 “ bear upon the ground.”

3. Each set of ploughs is lifted separately “ by mounting three  
 “ worms or screws separately upon one spindle, which spindle  
 “ is made to clutch only one of such worms at a time, and  
 “ which it rotates when turned by hand ; one of these worms  
 “ are geared into a quadrant or wheel connected to the axis of  
 “ the travelling wheels ; the other two are each separately  
 “ geared into screw wheels each of which is mounted on a  
 “ spindle forming the fulcrum of a lever ; from the after part  
 “ of such lever a plough frame is suspended, such levers  
 “ and worm wheels are arranged to be made fast or to be released from turning with such spindle ” as required.

4. India-rubber or other springs are fitted to the draw bars, so as to lessen sudden strains on the traction rope.

5. In one-way implements a jointed beam, hinged to the fore part of the frame and connected to a lever at the back carries tines, &c. of the character required. The beam is held in the required position by “ a serrated lever fixing formed by  
 “ hinging upon the back of the framing of the implement a  
 “ casting with a serrated or notched face on the wheel lever to  
 “ which the hind wheels are attached.” Each of the cross bars is “ cylindrical internally and in one piece, with a feather  
 “ or key cast thereon, on which the pad or boss is fixed or slipped which carries the tines.”

(Printed, 2s. 6d. Drawings)

A.D. 1864, July 14.—No. 1765.

THURGAR, WALTER CHRISTOPHER.—“ Instrument for protecting gardens and fields from birds.”

A drum or barrel is mounted on a spindle with one end open and the other closed. Round the closed end of the drum is



a series of nippers on which percussion caps are placed, these are exploded by a hammer which is raised by a cam and brought down by a spring. The barrel is revolved by a ratchet, as each cap is exploded. The whole is worked by clock-work.

[Printed, 16d Drawing.]

A.D. 1864, July 15.—No. 1775.

WINTON, PETER.—(*Provisional protection only.*)—"Reaping machines."

The following is the whole Provisional Specification.—

"This invention of improvements in reaping machines relates more particularly to the parts of such machines concerned in the laying over of the crop to the cutters and in the delivering of the cut crop. In a machine made with the improvements the driving wheel and gearing for giving motion to the cutter bar are arranged at one side in the usual manner. Two blades or paddles for laying over the crop and two rakes for delivering it are attached to arms fixed upon a single shaft, and this shaft is mounted in an inclined position, the blades and rakes being set on their arms with corresponding inclinations, so that at the lower part of their circular traverse they become horizontal or nearly so. The inclined shaft is connected by a universal joint to a shaft which is driven by suitable gearing from the main driving shaft, the universal joint being of the well-known simple kind in which a central ball or cross is connected to one shaft by a pair of diametrically opposite joint pins which are at right angles to another pair of joint pins connecting it to the other shaft. It is a well-known property of this joint that if the motion of the driving shaft is uniform that of the driven shaft varies regularly round the circle, and it is to take advantage of this property that the joint is used in this case, the rakes being fixed in such positions relatively to the joint as that each moves more quickly when communicating to act on the cut crop, and more slowly when it has raked it off the platform and should drop it. With this varying motion the delivery is effected in a very satisfactory manner and the entire arrangement is simple and effective."

[Printed, 4d. No Drawings.]

A.D. 1864, July 16.—No. 1794.

CRANSTON, WILLIAM MCINTYRE.—(*A communication from Waller Abbott Wood.*)—"Mowing and reaping machines."

"The innermost end of the cutter bar is attached to and supported on a shoe; as heretofore this shoe is attached by two pin points to two projections on a lever, the hinder end of which is capable of rising and falling where it embraces the axle of the machine, there being a slot in the lever to admit of this movement. The fore end of the lever has a wheel or roller resting on the ground and the lever with its shoe is attached to the hand lever for raising it by a chain. In addition to the shoe being attached by two pin joints to the lever it is further connected by a short lever, the outer end of which is pin-jointed to projections on the upper surface of the shoe. This short lever has a notch on its upper edge a little beyond where its end is pin-jointed to the projections on the shoe. The end of the short lever next the machine has a hole through it to admit of a pin being passed through it and through projections on the lever to which the shoe is attached. Or the pin may be passed through the projections on this lever, and over the short lever, so as to admit of the short lever sliding between the two projections and under the pin. On the upper edge of the short lever there is a second notch near the hole, which, when the short lever is slid in a short distance, and the end of the short lever is raised by a chain at the end of the other or hand lever, such notch will embrace the pin and allow of the inner end of the short lever pivoting on the pin, or the short lever may be slid further inwards so as to bring the first mentioned notch to embrace the pin. By these means the cutter bar and shoe may be caused to assume varied positions in respect to the framing of the machine, and when at work the cutter bar will be able more effectually to act, notwithstanding irregularities of surface."

[Printed, 10/1 Drawings.]

A.D. 1864, July 25.—No. 1851.

NEWTON, WILLIAM EDWARD.—(*A communication from Valerian Ivanovitch Kirchner.*)—(*Provisional protection only.*)—"Machinery for mowing and reaping."

The knives are longer and more numerous than usual, and are driven at a less speed. "Each of the cutting instruments " is composed of two thin blades of steel connected together " at the middle. These blades enter notches or slots first in the right and then on the left of them as they are reciprocated " There is a band over the driving wheel, and " the edges of " this band are cut out or made in a wavy form, and against " them bear antifriction rollers attached to the end of an arm " connected to rocking levers to which the knife bar is jointed " The automatic rakes are composed of a system of six moveable parallelograms, provided at one of their extremities " with arms, which are extended outwards." "The nave of " the driving wheel is connected by means of a clutch to a " shaft which carries two eccentrics, which by means of " levers act on the system of parallel grams, and thereby " communicates a to-and-fro movement to the rakes "

[Printed, *id.* No Drawings.]

A.D. 1864, August 10.—No 1991.

**DANNATT, ROBERT.**—(*Provisional protection only.*)—"Apparatus for cultivating land."

The invention consists in "the application of certain cutting " parts to the shares " of ploughs, &c. The inventor proposes to "fix on or form in a piece with the share one or more " vertical cutters, by preference three or four in a plough, " with mould boards, which cutters sever the soil in a vertical " direction simultaneously with its severance horizontally by " the share." There is "a series of ribs on the mould board, " formed in continuation of the cutters of the share." The cutters have sharp edges, and are "by preference inclined " backwards, or they may be of a curved form." Scarifiers and cultivators are similarly fitted. In "scarifying or paring " implements," there is "at the rear of each share an inclined " plate or bed piece, which raises the soil up, and over which " it passes after being cut up by the share." In ploughs there is "a wheel near the heel and under the mould board " which follows on the track cut by the share." "This wheel " removes part of the pressure from the sole of the plough, " and can be adjusted to regulate the depths of the ploughing. " it also facilitates turning at the headlands."

[Printed *id.* No Drawings.]

A. D. 1864, August 11.—No. 1998.

CHILDS, AUGUSTUS BRYANT (*A communication from Richard Lamb Allen.*) "Chipper mowing machine"

The machine is supported on two bearing wheels, both of which serve, by means of ratchets, to give motion to the main driving shaft. All the gearing is cased in within a cast-iron box. The knife bar, &c. is jointed, and can be raised to a vertical or inclined position by means of a lever acting through a chain attached thereto. The height of the knife can be adjusted by means of "moveable false shoes" fitted under the shoes supporting the knife and capable of being bolted at any required distance from these shoes. The connecting rod has a "spherical joint" to admit of its acting when the knife is inclined. The fingers are lined, each with a "small slip of steel plate." There is an "adjustable trackboard" at the end of the knife fitted so as to throw the cut grass inwards and thus leave a clear track for the next traverse of the machine. The knife and the driving gear are mounted in a frame that can be turned round the main axle, but so as to keep the first pinion always in gear with the spur wheel on the main driving shaft. A lever is arranged so that the knife, &c. can be moved to and held in any position required, the lever being dropped into any one of a series of notches. By removing one of the bearing wheels and certain parts of the driving gear, the knife, &c. can be carried over to the other side of the axle, so that "the machine is changed from a front to a rear cutting machine, and vice versa." The whiplashes, instead of being attached to the pole, are suspended "so as merely to slide in a groove situated under the pole, and from thence by means of a link or chain cause the draught to be exerted on a transverse bar situated considerably below the level of the axle, and nearer that of the knife."

[Printed, 1s. 6d. Drawings.]

A. D. 1864, August 12.—No. 2006.

BRENTON, WILLIAM.—"Reaping machines."

The invention relates to improvements in the delivery apparatus of reaping machines. "A roller is mounted upon a shaft behind the finger bar and cutters; one end of this roller

" shaft revolves in a fixed bearing, the other end is carried by  
 " a lever which vibrates upon a fulcrum. Upon the outer  
 " end of this roller shaft there is a friction wheel, immediately  
 " opposite to but out of contact with a corresponding friction  
 " wheel on the large driving wheel." To form each sheaf, a  
 treadle on the end of the lever is depressed, the roller is thus set  
 in motion, and the sheaf delivered. To obtain a side delivery  
 a quadrant-shaped board may be attached behind the roller,  
 with a second conical roller along its side, driven by a cord  
 from one of the friction wheels. This board is supported behind  
 by a castor wheel

(Printed, &c. Drawing.)

A.D. 1864, August 15.—No. 3028.

CHILDS, AUGUSTUS BRYANT.—(*A communication from Zeas  
 Cobb*)—"Machines for ploughing or cultivating land."

The implement described consists of a plough with one or  
 more bodies mounted in a frame fitted to rise and fall within  
 an outer wheeled frame. The axle-boxes of the inner  
 frame slide up and down in suitable guides, and can be  
 raised and depressed independently by a screw. The inner  
 frame is formed with a "cast-iron yoke" at the back. It is  
 supported by metal straps from the outer frame pivoted at  
 the ends to the frame. A winch mounted on the outer frame  
 raises or lowers the inner frame by means of a chain.

(Printed, &c. Drawing.)

A.D. 1864, September 6.—No. 2176.

CORBETT, SAMUEL, and CORBETT, WILLIAM.—(*For a full  
 protection only*)—"Agricultural implements called Norwegian  
 " harrows."

The inventors say,—

" Our improvements in Norwegian harrows consist in  
 " fixing the spikes in such a manner around the axis  
 " which they rotate that they do not follow each other  
 " in a straight line, but describe lines oblique to the  
 " path of the harrow. We effect this object in the fol-  
 " lowing manner:—Instead of fixing each set of spikes  
 " in a plane at right angles to the axis about which they  
 " rotate, we fix them in a helical or screw-like direction  
 " around the said axis; by thus fixing the spikes they do not

“ follow each other in the same track, and they more  
 “ thoroughly clean and pulverize the earth than when fixed  
 “ in the ordinary way. We make the spikes of iron or steel  
 “ and screw or otherwise fasten them in a helical or screw-  
 “ like direction in a bar or tube of iron, steel, or wood, or we  
 “ make the spikes with bosses having square holes in them  
 “ and we pass a square axis through the holes, the said holes  
 “ being so arranged that the spikes when put in the axis have  
 “ the required screw-like arrangement. The form of the  
 “ spikes may be varied to suit the nature of the soil.”

[Printed, &c. No Drawings.]

A.D. 1864, September 7.—No. 2187.

HUNTER, WILLIAM ANTHONY.—(*Provisional protection only*)  
 —“ Machinery for reaping and mowing.”

The following is the whole Provisional Specification.—

“ My invention consists in an improved combination of  
 “ machinery for giving the requisite lateral to-and-fro motion  
 “ to the cutters of reaping and mowing machines. The cutters  
 “ are fixed as usual to a horizontal bar working in guides; to  
 “ this bar are fixed studs supporting two anti-friction bowls,  
 “ between which the outer circumference of a diagonal disc  
 “ enters, this disc is fixed on the driving or other shaft of the  
 “ machine, and in revolving gives the requisite lateral to-  
 “ and-fro motion to the cutter bar.”

[Printed, &c. No Drawings.]

A.D. 1864, October 1.—No. 2418.

WINTON, PETER.—“ Reaping and mowing machines ”

“ A horizontal cast-iron frame of rectangular form is  
 “ formed with plain eyes in the inner and outer sides of it,  
 “ and the main shaft is entered through these and through  
 “ the eye of the driving wheel placed in position within the  
 “ frame. The intermediate shaft for working the cutter bar  
 “ is set on the frame within the rim of the driving wheel,  
 “ and drives the inclined shaft on the outer side of the frame  
 “ by bevel gearing in the usual way, being shifted into gear  
 “ with or out of gear from the spur wheel or rim on the main  
 “ wheel by means of a lever and clutch.” The pole is of  
 tubular iron, and there is no fore wheel. “ The delivery is self-



" acting and is effected by two rakes or arms fixed on a shaft  
 " which is inclined inwards and backwards from the vertical,  
 " being principally held near its upper end by a bracket fixed  
 " to the rectangular frame. The inclined shaft is driven by  
 " bevil gearing directly from the main shaft." It is thrown  
 out of gear by the same movement which throws the cutting  
 apparatus out of gear. The platform "is quadrant shaped in  
 " plan, and is curved horizontally to the conical form swept  
 " through by the rakes descending a little just behind the  
 " cutters, and rising considerably at the back end."

[Printed, 10d. Drawing.]

A D 1864, October 4.—No. 2442.

BOUSFIELD, GEORGE TOMLINSON. (*A communication from  
 Thomas Jefferson Timball*)—"Harvesting machines"

1 The main frame is constructed with a "tubular socket,  
 " in which the axle of the running wheels is secured in such  
 " manner that said tubular socket accomplishes the double  
 " purpose of the ordinary pillow blocks to sustain the said  
 " axle, and of ribs to stiffen the main frame transversely."

2. This head "consists in combining the tongue," to which  
 the horses are attached, "with the main frame by means of a  
 " socket cast in one piece with the said frame, so that the  
 " sides of the said socket form ribs which stiffen the frame  
 " longitudinally with the line of draught while at the same  
 " time the said socket is the means of securing the tongue  
 " firmly to the main frame."

3 The various cog wheels are mounted on "silent or still  
 " shafts," on which they run, instead of having journals  
 " turning in bearings. The hubs of the wheels can be ex-  
 " tended along the shafts" to provide "a greater amount  
 " of wearing surface."

4. Two of the train of wheels operating the cutter are con-  
 nected by means of "an intermediate saw-toothed spring  
 " clutch," so that the cutter is thrown out of gear auto-  
 matically by the backing of the machine, or when required  
 by means of a lever.

5. "This part of the invention consists in combining the  
 " main frame and the cutter bar together by logs, which are  
 " traversed by one of the pinion shafts of the cutter gear in

“such manner that the said shaft performs the double purpose of a pinion shaft and joint pin for the hinges, and that the cost of a special joint pin is saved”

6. The cutter bar, &c is raised by a chain wound on a barrel rotated by a lever. A ratchet serves to hold the barrel at any point required, and the cutter can be lowered either by throwing the pall back from the ratchet, or by using a “disengaging brake lever” which forces the barrel back so as to throw the ratchet wheel out of gear, and at the same time acts as a friction brake to prevent the cutter bar descending too rapidly

7. This “consists in combining the pair of bevelled wheels with flanges, which engage with each other, and prevent the movement of the wheels in the direction of their axes of revolution”

8. A spring clutch is used to prevent the reel revolving when the machine is backed.

9. The reel shaft is hollow and works over a rod connecting the upper ends of the standards.

[Printed, 1s. 6d. Drawings.]

A.D. 1864, October 7.—No. 2466.

STEEVENS, WILLIAM.—(*Provisional protection only.*)—“Steam engines and implements for the cultivation of the land by steam power.”

The first part of the invention relates to agricultural steam engines and hauling apparatus.

The second part relates to “improvements in arranging sets of ploughs and other implements for tilling the land by steam power.” The inventor says:—

“For this purpose I prefer three strong iron frames, one main top frame supported on wheels, and two under frames with ploughs attached, which move up and down. To raise and lower these under frames I have powerful screws fixed on the top frame where the ploughman can act on them for the purpose of raising and lowering the ploughs, and causing them to be withdrawn from or inserted into the ground by the action of the screw as may be required.”

[Printed, 4d. No Drawings.]

A.D. 1864, October 8.—No. 2481.

COLEMAN, HENRY SEPTIMUS, and MORTON, ALFRED GEORGE EDWIN.—“Application of steam power to the cultivation of  
“land.”

The first part of the invention relates to a method of ploughing. Two engines and two implements are used, with an endless rope. One implement works from the centre of the field up to the engine, the other from the opposite engine to the centre of the field. They work alternately, one running back over the unbroken ground while the other is in operation. Both engines are effective at the same time. One acts directly on the implement at work, the other draws back the implement not at work, and also acts on the drum of the first engine, transmitting its surplus power through it to the first implement.

The second part of the invention refers to hauling drums.

[Printed, 10d. Drawing.]

A.D. 1864, October 21.—No. 2615.

HORNSBY, RICHARD.—“Reaping and mowing machines.”

The crop is received from the cutters by endless chains or bands, travelling diagonally across the platform. These may be used in combination with a tilting platform from which, when sufficient has collected, the chains receive the crop and deliver it on to the ground. A stationary platform also may be used, from which the workman rakes the cut crop on to the chains. The chains may be fitted with teeth, and the pulleys over which they work have fixed guards between them, to clear the teeth and prevent clogging. In place of the chains a rake may be used which sweeps across the platform. It is arranged to move over the surface of the platform from the front to the back and then to return on the under side. It is by preference actuated by an endless chain attached near its outer end, and its inner end turns on a centre or pivot supported by a bar connecting the corner of the platform with the frame, and the centre or pivot is itself able to move around the bar as the rake passes from the under to the upper side of the platform, and vice versa. In passing over the platform the teeth of the rake are held upwards, as it passes below the platform they are turned downwards.

Rake arms are used to bring the corn up to the cutters, and to discharge it from the platform, in the usual manner. These work over a cam surface as usual so that the rake arm in action is lowered, and the others raised. The arms either work independently, or if the opposite pairs are connected, they are set nearly at a right angle, so that the arm out of action is raised to a nearly vertical position. It is thus enabled to pass beside the driving wheel instead of over it. Some of the arms (preferably the alternate arms) may have beater boards, in place of rakes.

To enable the finger bar and cutters to follow undulations in the land, the following arrangement is adopted:—"The inner end of the finger bar is jointed by a wide and stiff hinge joint to a connecting bar, which at its other end is jointed to the frame, but in place of making the latter joint simply a pin joint as heretofore which allows the connecting bar to play up and down only, I make it a ball-and-socket or similar joint, so as to allow (in addition to the up-and-down motion) of a turning or twisting of the connecting bar in the direction of its length. In order that the finger bar may be guided steadily over the land, a castor wheel is attached or connected to its inner end at the front of the shoe."

The pinion gearing with the first spur wheel is mounted so that it can be drawn out of gear therewith when the machine is being transported from place to place. "Through a bearing or socket on the frame of the machine a tube is passed, the axis of the pinion passes through this tube and slides therein. On the exterior of the tube is a stud which projects out through a slot in the side of the socket in which the tube is retained, thus the tube is prevented turning, but it is able to slide longitudinally, and it is so moved in order to throw the pinion and also the gear wheel at the other end of the axis out of gear by a lever taking hold of the stud on the tube and moving it along the slot." "The axis is not able to move longitudinally independently of the tube, as the tube is made of a length equal to the whole distance of the pinion at one end of the axis from the gear wheel at the other."

Instead of the above arrangements, the axle of the bearing wheels may be cranked, and a handle mounted thereon

" so as partly to rotate the cranked axle, and thus the wheels  
 " are moved up to or caused to recede from and out of gear  
 " with the pinion " Also, this handle may be " arranged to  
 " be locked in either of three positions to admit of the use of  
 " change pinions," for different speeds.

A sledge or roller is jointed to the " scraper board," and this  
 by " passing over the ridge of cut crop raised by the scraper  
 " board presses it down and consolidates it, so that the wind  
 " can hardly disturb it."

[Printed, 2s. 10d. Drawings.]

A.D. 1864, October 31.—No. 2693.

ANDREASEN, NIELS FREDRICK. — (*Provisional protection only*) " Apparatus for distributing liquid manure and sowing  
 " seed."

The apparatus consists of a four-wheeled cart divided into  
 two compartments, a larger one in front containing the liquid  
 manure, and a smaller one behind for the seed. A sliding  
 plate reciprocating over a row of holes allows the manure to  
 pass to a series of hollow coulters. A roller "with vanes or  
 " wings " delivers the seed to seed tubes which conduct it to  
 the furrows. The axle of the hind wheels is adjustable to  
 regulate the depths at which the coulters work. Between each  
 coulters and seed tube is a pressing "shoe." A revolving  
 agitator is fitted in the seed receptacle.

[Printed, 4d. No Drawings.]

A.D. 1864, November 14. -No. 2832.

NOONE, GEORGE EDWARD.—Treating sewage.

Town sewage is distilled in an apparatus of special construc-  
 tion, the solid and liquid being separated. The liquid portions  
 are received in tanks, in which " the essence of any known  
 " fertilizing products or any required proportion of the pro-  
 " ducts obtained " " from the sewage may be added " " The  
 " liquid may be conveyed from sluices in the tanks through  
 " pipes to depôts in various localities, or the liquid may be  
 " stored in barrels." The Provisional Specification adds —  
 " at the request of farmers services can be laid down from the  
 " nearest depôt to the commencement of their land, and con-  
 " tracts per annum entered into for the manure, and on

“ different days may receive through the same mains manure  
 “ applicable in its fertilizing properties one day for grass, next  
 “ for corn, third for turnips, fourth for hops, and so on.”

[Printed, 2s. Drawings.]

A.D. 1864, November 18.—No. 2881.

SARGEANT, WILLIAM. — (*Provisional protection only.*) —  
 “ Horse-hoes and seed or other drills.”

The fore part of the carriage is mounted “ upon wheels at  
 “ each side capable of being controlled ” “ by suitable steering  
 “ apparatus actuated from the hinder part of the carriage.”  
 These wheels are carried by adjustable standards from which  
 levers are carried back to a cross bar for guiding the imple-  
 ment. The hind part of the carriage is supported on a single  
 wheel or pair of wheels, and this may either be left free to  
 follow the direction of the carriage, or fixed by a pin. For  
 purposes of transport shafts are fitted to the hinder part of the  
 frame. The driving wheel is fitted “ upon a tube or hollow  
 “ axle which revolves on the axle of the implement, in place  
 “ of connecting such driving wheel to the hub of the travelling  
 “ wheel, which ” “ is capable of adjustment upon the hollow  
 “ axle to vary the width apart of the steerage wheels.”

[Printed, 4s. No Drawings.]

A.D. 1864, November 18.—No. 2889.

PIESSE, SEPTIMUS.—(*Provisional protection only.*) — “ Appa-  
 “ ratus for creating and projecting cold vapours ”

The following is the whole Provisional Specification :—

“ This invention relates to a peculiar combination of appa-  
 “ ratus for creating and projecting cold vapours, and con-  
 “ sists of two tubes with contracted nozzles placed at right  
 “ angles or nearly so to each other, and with their nozzles in  
 “ close proximity. One of three tubes is connected with a  
 “ flexible air-tight bag of india-rubber or other suitable  
 “ material, or with any equivalent apparatus which can be  
 “ readily contained in the hand, and which on being alter-  
 “ nately compressed and allowed to expand will direct a jet of  
 “ air through the nozzle of the first tube and across the  
 “ nozzle of the second tube, which tube is plunged at its lower  
 “ end either into water, perfumed spirit, chloriform, ether,



“ ammonia, tobacco juice, or other fluid. The partial vacuum  
 “ produced in the second tube by the jet of air directed across  
 “ its mouth or nozzle causes the fluids to rise up the tube in  
 “ the form of a jet, against which the air impinges, and  
 “ thereby breaks or scatters it in the form of very fine spray  
 “ or cloud, the rapid evaporation of which produces a vapour  
 “ of a very low temperature. This apparatus may be used  
 “ for perfuming the air, the body, or wearing apparel, for  
 “ cooling the head, and for cooling generally. It is also  
 “ useful for projecting certain fluids on to plants for the  
 “ destruction of insects.”

[Printed, 4d. No Drawings.]

A.D. 1864, December 6.—No. 3043

BURGESS, WILLIAM JAMES.—“ Reaping and mowing machines.”

“ The gearing is combined and arranged in such manner as  
 “ to be contained within and protected by the main wheel.  
 “ The gearing receives motion from the rotation of the main  
 “ wheel by means of teeth formed on the interior of the main  
 “ wheel. The main wheel turns freely on its axle, from which  
 “ is suspended the cutter bar, by means of a cast-iron frame  
 “ connected to the axle. The teeth on the interior of the  
 “ main wheel take into and drive an intermediate wheel, the  
 “ stud or axle of which is carried by a projection formed on  
 “ the suspended frame before mentioned. The intermediate  
 “ wheel takes into and drives a pinion on the boss or nave of  
 “ a bevil wheel, which by an upright crank shaft gives motion  
 “ to the cutters, there being a bevil pinion on such crank  
 “ shaft which is driven by the bevil wheel. The bevil wheel  
 “ and its pinion turn freely on the axle of the main wheel,  
 “ and are contained within such main wheel. The shafts are  
 “ attached to arms, the back ends of which are carried by and  
 “ move freely on the axle of the main wheel. On the sus-  
 “ pended frame is fixed or formed a curved tooth rack which  
 “ gears with a screw, the axis of which is in bearings affixed  
 “ to one of the projecting arms, by means of which the position  
 “ of the cutter bar can be regulated.”

[Printed, 1s. 4d. Drawings.]

A.D. 1864, December 19.—No. 3141.

HOPKINS, JOHN ARTHUR, and CULPIN, CHARLES.—(*Provisional protection only.*)—"Ploughs and apparatus for tilling the soil."

The following is the whole Provisional Specification:—

"Our invention has for its object the performance of the processes of ploughing and subsoiling in one operation, which processes of ploughing and subsoiling have hitherto been performed as separate and distinct operations, and by means of separate and distinct implements. The combining in one and the same implement a plough of the ordinary construction with an apparatus for subsoiling herein-after described, and further, the construction of subsoiling apparatus so as to be readily adapted and attached to the various kinds of ploughs already in use, and worked in combination therewith. Our subsoiling apparatus consists of one or more share or shares, points, prongs, or tines, secured by bolts or other convenient means to the body or frame of the plough in such a position as to penetrate the soil in the rear of the ordinary share; such subsoiling apparatus is adjusted by screws, levers, or other suitable mechanical arrangement, so as to break up the subsoil to any required depth below the bottom of the furrow as made by the ordinary share. For adapting our invention to the various kinds of ploughs already in use, we fit the said subsoiling apparatus to an adjusting clutch which is readily attached to any plough by screws or other suitable fastenings. The above-named share or shares, points, prongs, or tines, forming the said subsoiling apparatus, are applied in different numbers, shapes, sizes, and degrees of sharpness to suit the various kinds of soil."

[Printed, &c. No Drawings.]

A.D. 1864, December 28.—No. 3223.

BLANCHET, ARISTIDE PAUL.—(*Provisional protection only.*)—"Application of steam power to the cultivation of land."

A locomotive is described which advances forward a short distance over the field and anchors itself by a prop forced into the ground. It then winds up a rope which draws a plough up to it, this rope having been allowed to run out during the

forward movement of the engine. The ploughs are mounted on a suitable wheeled frame, and are set so as to follow one another.

[Printed, 4d. No Drawings.]

1865.

A.D. 1865, January 5.—No. 34

SKELTON, JOSEPH —Ploughs

The inventor says: "My invention relates to improvements in the construction of ploughs, whereby I am enabled to shift either of the mould plates free of the land side or furrow by the simple turning of a turn-wrest handle either to the right or left, or by any other mechanical contrivance, such as a lever or screw shaft; while by the same action the other plate is thrown forward, together with the greater for commencing the return furrow. The turn-wrest handle is fixed between the two plough arms or directors; it actuates a shaft at the end of which a pinion or toothed wheel is fixed, gearing with a horizontal segmental rack or quadrant set on a vertical axis, and connected to the two mould plates. It is therefore obvious that by winding the turn-wrest handle in the required direction, one or other of the plough moulds will be shifted free of the furrow as first stated."

[Printed, 6d. Drawing.]

A.D. 1865, January 12.—No. 100.

RUSS, WILLIAM.—"Apparatus for distributing liquid manure"

A hollow drum is mounted on a suitable carriage. On the drum is wound a coil of hose pipe, one end of which is attached to a stand pipe supplying the liquid manure, and the other discharges through a hollow trunnion of the drum into a vessel mounted beside the drum. From this the liquid passes to a distributing pipe which delivers it over the ground. Cogged gearing between the drum and the axle of the bearing wheels revolves the drum and winds up or lets off the hose as the apparatus approaches or recedes from the source of supply.

Water alone may be thus employed, and pulverised guano, &c., may be delivered by an endless chain of cup wheels from a hopper below into the receptacle whence the liquid is distributed over the land. The shafts for draught may be attached to either end of the framing.

[Printed, 10d. Drawing.]

A.D. 1865, January 23.—No. 200.

NEWTON, WILLIAM EDWARD.—(*A communication from Valdivian Ivanovitch Kirchner.*)—"Machinery for mowing and "reaping."

The object of the invention is to do away with spur gearing. The driving wheel has cam surfaces formed on its rim and these are embraced by a frame carrying friction bowls, and this actuates a lever whence the required reciprocating motion is given to the cutters. These are longer than usual.

"The automatic rakes are composed of a system of six "moveable parallelograms" or "levers on the lazy-tongs "principle" which are caused by eccentrics to move to and fro across the platform. When in work the machine is supported on a second bearing wheel outside the platform, but for travelling purposes this wheel is removed, the platform turned up, and another wheel fitted on the opposite end of the axle of the driving wheel outside the frame.

There is a reel over the cutters.

[Printed, 10d. Drawing.]

A.D. 1865, February 1.—No. 279

SAINTY, JOHN.—"Lever horse hoes and lever corn drills."

The coulter is kept down to their work by springs instead of weights. From the bracket carrying the cross bar to which the front end of the coulter levers are pivotted, arms extend backward carrying a cross bar at the back. A guard extends downwards from this bar to each lever, and receives the end of a spring mounted on the lever. The pressure of the spring can be regulated by causing it to bear against a pin which can be placed in any one of a row of holes in the guard. "Mounted "on the cross bar" "near their opposite ends" are a pair of "link bars" "which are jointed respectively to the lower "ends of one of a pair of shackle frames," "and serve to sup-

"port them; these shackle frames are connected together by means of a hand bar which extends across the back of the implement and is held by the attendant." "These frames have a sector-shaped opening at their lower part to allow of the link bars rocking freely therein, and at their upper part they have a long narrow slot or opening for the purpose of receiving a pin or bowl carried by the side frames." These slots "terminate at top in a seat and at bottom in a bearing for the pins" so that the coulters can be held down to their work, or raised and supported clear of the ground.

[Printed, 10d. Drawing.]

A.D. 1865, February 9.—No. 366.

WINDEB, RICHARD —(*Provisional protection only.*)—"Ploughing and performing other like operations upon the land by steam power."

The frame of the implement has mounted upon it a pulley, round which passes a chain laid down along the land and secured by anchors at the headlands. A steam engine also mounted on the frame actuates the pulley, and thus draws the implement across the field. The chain is by preference "square linked" "similar to those used in dredging machines," but an ordinary chain or rope may be used. If a chain is used, the pulley has suitable cogs which take into the links of the chain. The frame is fitted with bearing wheels which can be thrown into gear with the engine to enable the machine to be transported from place to place without employing the chain. The implement is steered by wheels at the ends, operated by chains and a steering-wheel. The tools are raised by racks, &c.

[Printed, 8d. Drawing.]

A.D. 1865, February 11.—No. 384.

BARBER, DAVID HENRY.—"Improvements in reaping machines, parts of which improvements are also applicable to mowing machines."

Improvements on No. 726, A.D. 1864.

The platform is supported on a wheel the axle of which has on it a serrated plate, the teeth of which fit into slots in a fixed plate. By means of an adjustable bolt, the teeth may be

made to engage with any of the slots as required, and the height of the platform thereby adjusted. The rear part of the platform is connected to the back of the frame by a bar, hinged to two lugs, one on the platform and one on the frame. A chain fixed to this bar can be hooked at different heights to a hook on the back of the frame so as to raise the platform. The reel is adjustable, the bearings of its shaft being carried by a bracket which slides along the standard, and can be clamped thereon by a hand lever with an eccentric on the end. The standard also can be set at any angle required. The reel band is kept tight by a pair of tension pulleys on an adjustable arm which may be worked by a hand lever that raises the reel standard by a chain and quadrant. The pole can be lengthened by adding an additional piece, which is secured by a ferrule and bolts. The bearing wheel near the platform (there being two bearing wheels) is protected by a shield which prevents its being clogged. The improvements, except those connected with the platform, are applicable alike to reapers and mowers.

[Printed, 10d. Drawing.]

A.D. 1865, March 1.—No. 576.

HENWOOD, NICHOLAS.—(*Provisional protection only.*)—Reaping machinery.

The following is the whole Provisional Specification:—

" My invention of improvements in reaping machinery relates to a novel arrangement of parts adapted for effecting a self-acting sheaf delivery from reaping machines. The invention consists in the use of a series of vertical turnstiles, which rotate in pairs and gather the stalks of corn as they are cut, and deliver the same in sheaves or bundles either at the back or at the side of the machine. These vertical turnstiles are mounted on upright shafts which are driven in either direction by suitable toothed gearing, or by means of belts and pulleys actuated by the main driving wheel, or from the gear which drives the gatherers in front of the machine. The turnstiles are provided with one or more arms according to the crops they are intended to reap, and of course they must be driven at different speeds to suit the crops, for which purpose sets of different sized pulleys or gear wheels must be mounted on the driving shafts so that they may be thrown in or out of gear when required. A



" spring catch is adapted to the lower end of the turnstiles  
 " and is worked by the hand or foot of the driver when it is  
 " required to stop or put in motion the turnstiles. The turn-  
 " stiles may be made capable of expanding to suit different  
 " crops, and the driving gear must be arranged to admit of  
 " the machine being moved either forwards or backwards as  
 " may be required."

[Printed, &c. No Drawings.]

A.D. 1865, March 10.—No. 671.

PHILLIPS, EDWIN ADDISON.—(*A communication from Cicero Constock.*)—"Rotary spader or digging machine."

The machine consists of a frame supported on a pair of bearing wheels. The digging blades "are secured to fork shafts or bars considerably longer than the distance between the travelling wheels. These fork shafts are hung or connected to the inner surface of the travelling wheels, near the circumferences of the latter, by means of arms cast or otherwise formed on the shaft, said arms being pivoted to allow a swing motion. Across the periphery of the wheels are cut deep recesses or grooves curved to correspond with the curves described by the swing of the fork shafts, and into which the said shafts pass." "Outside each wheel, and close to its hub, is placed upon the axle a stationary cam, around which the fork shafts pass." "These cams are fixed to the frame of the machine, the axle rotating with the travelling wheels. For partially governing the action of the fork shafts, a bar or lever with its inner face concave to correspond with the periphery of the cam at its front part, is used. This concave faced bar forms with the cam a groove or guide way for one end of the fork shafts, thereby holding the fork tines firmly, and throwing them into position at the required time for penetrating the ground." "As the machine travels forward, friction wheels on the ends of the shafts are carried round the cams, which "are so shaped in front that each row of fork tines strikes the ground at a distance ahead of the preceding one equal to the distance between the fork shafts." "The shape of the said cams then permits the fork shafts to gradually recede into the recesses in the periphery of the travelling wheels while the fork tines are entering the earth." "By withdrawing

" the curved face bar from the front face of the stationary cam, each row of fork tines falls down upon the preceding fork shaft," and the machine can be moved from place to place. This movement is effected by a foot lever. Springs are fitted to the "fork shafts" to prevent shocks.

[Printed, 2s. Drawings.]

A.D. 1865, March 10.—No. 675.

WRIGHT, GEORGE.—"Agricultural implement"

" This invention relates to an instrument for 'forking' land, and consists of the following mechanical arrangements, that is to say, in a suitable framing mounted on running wheels, and upon the axle of said wheels " are placed loosely two or more discs of metal, the outer discs being placed asunder nearly the width of the inside of the framing aforesaid; around these discs and at equal distances asunder " are fixed "say ten or twelve horizontal bars of metal, the ends whereof rest in long holes formed in each of said discs; into holes in these bars and at equal distances asunder " are "tines" or prongs (one in each hole) either "straight or curved." This description is taken from the Provisional Specification, the corresponding passage in the Final being rendered unintelligible by the omission of several lines. The implement is drawn by a horse, and its use is to "fork" up the ground. In the drawing the bearing pieces of the axles work in guides on the frame and can be raised or lowered by a screw and winch handle. The shaft carrying the tines is not, as above described, the same as that on which the bearing wheels are mounted, but is fitted separately in the frame. Scrapers are fitted to clear the tines. The tine bars are according to another part of the Specification to be hinged to the discs, and their play limited by stops.

[Printed, 10d. Drawing.]

A.D. 1865, March 16—No 739.

SEAMAN, JOSEPH "Harrows, drags, cultivators, and other similar implements"

The beams of such implements are made of two bars "placed edgewise side by side, and held together by means of a square or other suitably shaped ferrule, through which the

"bars are placed." The tines are driven through holes in the ferrule, and between the bars, so as to tighten the bars in the ferrule. The beams are held apart by cross bars in the usual manner.

In "diagonal harrows," "the bars after passing through the ferrules, are spread open or bent at an angle laterally to give the harrow its diagonal form, the several ferrules and the teeth or tines therein being situate at the junction of the continuous angles."

"Where different kinds of shares, joints or other wearing parts are required," these are fixed to the stem by a socket and pin or otherwise, after the stem has been driven into its place. The different harrows are connected by short chains attached to hooks, each of which is "curved over the top of the tooth" so as to prevent the chain from becoming accidentally detached.

[Printed, &c. Drawing.]

A.D. 1865, April 4.—No. 956.

**BULSTRODE, WILLIAM.**—"Apparatus applicable to steam cultivation."

The object of the invention is to enable the snatch-block to be shifted from one anchor to the next while the implement is moving away from the anchor, instead of while the implement is standing still. For this purpose the two anchors are connected by a bar, held to each anchor by a short chain. This bar is equal in length to the breadth of the land taken at each bout. The link which holds the snatch-block to the anchor is provided with a small pulley which rides on the bar. While the implement is moving up to the anchor, the strain is taken by the anchor directly, through the link uniting the snatch-block thereto, but when the implement commences its traverse in the opposite direction, the link is unhooked from the anchor and the strain of the slack rope is taken by the cross bar. The diagonal pull of the slack rope draws the block along this bar, up to the next anchor, when the link is hooked to the anchor and the bar shifted so as to be ready for the next bout. The snatch-block is mounted on a sort of sledge so that it may slide over the ground.

[Printed, &c. Drawings.]

A.D. 1865, April 6.—No. 978.

BADGER, JOHN. — (*Provisional protection only.*) — "Harrow, cultivators, and other similar agricultural implements."

A harrow is constructed of bars of "a zig-zag form, or a form resembling that of a series of the letter V." These bars are joined into a harrow frame by connecting the angles of one bar to the angles of another, and so on. "The angles of the zig-zag bars of iron do not come into contact, but are separated by two parallel bars of iron, the said bars of iron bearing against the angles of the zig-zag bars." Also one straight bar may be used, or the straight bars may be dispensed with. "Clips of a rectangular form are passed over the two angles of the zig-zag bars to be joined, and through holes in the said clips the tines of the harrow are driven." The clips consist of two pieces of flat iron bent twice at right angles, so as to form three sides of a square. Each half clip has a hole made in its opposite sides of a size proper to receive the tine." Single clips may also be used, with a key to hold each in place.

[Printed, *ad.* No Drawings.]

A.D. 1865, April 7.—No. 996.

GRAY, WILLIAM, GRAY, EDWARD, and GRAY, JOHN. — "Ploughshares, socks or points for ploughs, cultivators, or scurri-furrows and other implements."

"This invention of improvements in the manufacture of ploughshares, socks, backs, or points to any shape or pattern to be used upon ploughs, cultivators, or scurri-furrows, and other implements used in the cultivation of the land where these points are used or required, consists firstly, in the manufacture of the above-named articles of cast steel, and more particularly that description of cast steel known by the name of welding cast steel, so that the articles when partly worn out can be relaid with steel by welding it to the socket on that part of the share that is not worn out."

And secondly, the invention consists in the casting of the above-named articles "in metal moulds with the use of steel or wrought-iron plugs to form the socket part of the articles produced."

[Printed, *ad.* No Drawings.]

A.D. 1865, April 20 —No. 1104

GREIG, DAVID (*Partly a communication from Max Eyth*) —  
 "Machinery for cultivating land"

1. The implements described are intended especially for cotton crops. "A shaft or axle is used, on which are placed "two, three, or more ploughs having between them narrow "rollers" "The distances between the ploughs are determined by having a greater or less number of such rollers "between the neighboring ploughs." The rollers near the ploughs are larger than those in the centre between the ploughs "Each plough is formed with two mould boards one "on each side of the share, so as to turn the land in opposite "directions, by which the furrows are produced, whilst the "rollers on either side consolidate the land." To carry the implement when not at work, wheels are fitted at the ends of the axle. These are removed when the implement is at work. The implement is drawn by a traction rope and engine, and steered by steering wheels in front.

2 For harrowing, a "frame of cultivating tines" is employed. This is triangular in shape, and has three wheels. The tines are double, and are placed "back to back" and "alternately act as cultivating tines and harrowing tines "according to the direction in which the machine is being "drawn" The stems of the tines are pivotted to the frame, and have a certain amount of play, so that when one tine is in the land, the other is raised out of it. The implement is worked by steam, &c., like the one first described.

[Printed, 1s. 4d. Drawings.]

A.D. 1865, April 21.—No. 1123.

HALL, COLLINSON — "Engines, machinery and implements  
 "employed in ploughing and tilling land."

The greater part of the improvements relate to agricultural engines, but the two following refer to implements:—

1. Improvements on No. 1338, A.D. 1864. Instead of the sector therein described, by which the ploughs, &c. are raised, the inventor uses a "rack on a horizontal longitudinal bar" This rack is traversed backwards and forwards by a pinion, suitably operated by the traction rope. Chains attached to the ends of the rack raise the ploughs, being attached either

directly to the ploughs, or to levers pivotted to uprights and connected by chains at their other ends to the ploughs, or to wheels on threaded blocks running on screws attached to the ploughs.

2. This part consists in "attaching to the frames of "scarifiers" &c., "blocks with circular or other shaped "holes or recesses in the front thereof, in which the heads "of the prongs" &c., are fitted. "The recesses are con- "tinned downwards, and are formed with tapered sides to "enable the tilling tools to accommodate themselves to both "the forward and backward travel of the implement. The "tools are contained in the recesses by sliding shutters or face "plates," or "to enable the tools to accommodate themselves "to any angle," there may be "a circular block or projection "on the back of each tool."

[Printed, 2s. 2d. Drawings.]

A.D. 1865, April 22 —No. 1124.

EVANS, ORMROD COFFEEN.—"Digging machinery."

Improvements on No 2848, A.D. 1855, and No. 2676, A.D. 1863.

The machines described in the Specifications of the two Patents referred to "consisted, one of a framework mounted "upon two truck wheels, and the other having a castor wheel "for the support of the front end of the frame, with an "additional frame inside attached to the outside frame; "and in which framework revolved side by side a series of "endless chains with teeth or digging forks attached, each "chain arranged upon a broad-faced drum wheel, as well as "two rollers placed at different levels, one before and the "other behind the drum wheel, and resting on that part of "the chain which was on the ground, so that as the machine "was drawn forward the digging forks were pressed into the "ground, and made to break and turn up the soil."

The outside frame is mounted on a pair of wheels which are adjustable vertically, the inner frame being also moved up and down by a segmental rack and pinion behind. A catch is arranged to hold the pinion at any required position of the rack. The front of the frame is mounted on a pair of "truck "wheels" "supported upon so short an axle as that when



"made to turn at a short angle, the wheels from 'out and  
 " 'out' may describe any part of a horizontal circle very  
 " little greater than is the diameter of each wheel." The  
 rollers over which the chains pass are so arranged that only a  
 single set of teeth are entirely in the ground at the same  
 time, and "the back of the drum wheels are arranged vertical  
 " to the backside of the rollers" so that "this part of the  
 " chains will be vertical accordingly, and therefore cause  
 " the teeth or digging forks " " to be suddenly lifted outward,  
 " upward, and above the ground." "Front rollers" may be  
 used or not. Instead of rollers, "two flanged discs" to each  
 drum wheel may be used. These are mounted on a shaft,  
 and the links of the chains rest on the flange, while the cross  
 link carrying the digging tools between the pair of chains  
 fits into the space between the discs. Two or three teeth  
 may be carried by each cross link, the centre one being  
 moveable.

[Printed, 1s. Drawing.]

A.D. 1865, May 4.—No. 1246.

STALKARTT, JOHN.—(*Provisional protection only*)—Ploughs

The improvements relate principally to ploughs to be drawn  
 by bullocks, but are applicable also when horses are employed.  
 The "angle of the share" is formed "in such manner" as to  
 " 'split' or break up the ground as it is turned over." To  
 prevent the share rising in hard ground, the point is made  
 " to project 1 to 1½ inch or thereabouts below the sole plate."  
 "The draught pole projects so far that a very short chain,  
 " varying from 1 to 2 feet is only required." "The plough is  
 " worked as close as possible to the motive power employed."  
 "In order to accomplish this it is necessary to 'cant' the  
 " pole about 4 inches to the left, and also to fix a side draught  
 " iron so as to obtain about 4 inches more on that side for  
 " the line of draught, which arrangement will bring the plough  
 " close up to the previous furrow." "One steering handle  
 " only is required" as in "the ordinary Indian plough."  
 When bullocks are employed, a yoke is used "formed with  
 " notches in it to fit the neck or hump of the animal, with  
 " metal or other bows to keep each animal in its place."  
 To enable the right hand animal to exert his full power,

" the draught must not be from the centre of the yoke, but  
 " about two inches leverage must be given in his favour "  
 The pole may be raised or lowered by means of wedges

[Printed, 4d. No Drawings.]

A.D. 1865, May 12.—No. 1321.

**WINDER, RICHARD.**—"Method of and apparatus for laying  
 " single line articulated railways and a method of propelling  
 " thereon particularly applicable for agricultural purposes "

The railway is formed of a single line of rails fitted on sleepers jointed together end to end. This is laid down across a field, and anchored at the ends. An engine travels thereon drawing after it the implement. The chief part of the weight of the engine is supported by grooved wheels running on this rail, and there is also a pair of grooved wheels, on vertical axes, gripping the rail between them. These can be tightened or loosened on the rail by a screw. In place of grooved wheels, spiked pulleys may be used, the rail between them being flexible. At each end of the engine is a frame for shifting the rail to the side, and laying it ready for the next traverse of the engine. These frames are used alternately, as the one for the time being at the rear only is employed, the other being hoisted out of use. The frame has a sloping platform with guides thereon; it passes under the rail and raises it, the guides carrying it to the side where it is laid down. Instead of the above method, "the system of rope or chain traction" described in No. 366, A.D. 1865 may be used.

The engine described is also available as a traction engine.

[Printed, 8d. Drawing.]

A.D. 1865, May 12.—No. 1326

**EDDY, JOHN**—Ploughs.

The invention refers principally to turn-wrest ploughs. Two double sets of mould boards and shares are used. The front set of each pair is intended "for removing and turning  
 " over the surface soil or 'spine,' and for ploughing in long  
 " dung or manure," and the rear set "for ploughing deeply  
 " into the subsoil, they being set considerably deeper than  
 " the front ones." "These mould boards are shorter, and are  
 " curved much sharper " than usual, to break up the soil and  
 leave it ready for sowing. The pitch of the front share and

mould board can be varied by a clamp or otherwise. The front steering wheels "have both their standards "secured to "one cross bar" "which is adjustable laterally across the "beam;" "this enables the land wheel to be set some few "inches to landward of the furrow, so as to be clear of the "track of the shares." The improvements can be applied to ordinary turn-wrest ploughs, "it being simply necessary to "remove the 'dys,' and to fill up the open space which will "be left by a sharp curve, and to add the front share and "mould board." The inventor says:—"By dividing my "improved turn-wrest plough so as to have one set only of "two shares and mould boards I obtain the same effect in the "form of a single plough." The improvements "are all "applicable to ploughs intended for steam cultivation."

[Printed, 10d. Drawings.]

A.D. 1865, May 15.—No. 1345.

BESLEY, HENRY — "Corn, seed, and manure drill"

The seed, manure, &c. is delivered to the tubes by endless chains running out of the seed box through openings in the side, and supported over suitable rollers, one within and one outside the box. The chains have "cups, holes, or other such "contrivance for retaining the corn or seed." The openings for the chain have slides, or india-rubber mouth-pieces, and can be regulated as to size. Stirrers are mounted in the box. The bottom of the box "forms a series of ridges and furrows." For different sorts of seeds different sets of chains are to be used, and the side of the box is changed accordingly.

The Provisional Specification also refers to "a screw or piece "of tubular iron with a bar or pin to raise or lower the "several manure boxes when going up or down hill."

[Printed, 2s. Drawing.]

A.D. 1865, May 18.—No. 1369.

BILLUPS, CHRISTOPHER SMITH.—"Apparatus for distributing "liquid manure."

The apparatus is intended to be used with a liquid manure drill, but it is also available for use separately.

An opening in the bottom of the trough containing the liquid manure delivers to a sloping board, from which the

liquid flows to a "distributing box, of a form somewhat like a fan, and provided in the interior with a number of radial partitions corresponding with the number of coulters." This box is to be suspended beneath the liquid reservoir in such a way that its own weight will keep it in a horizontal position." The "radial chambers" deliver to pipes leading to the coulters. A revolving agitator is mounted in the trough.

[Printed, 8d. Drawing.]

'A.D. 1865, May 18.—No. 1371.

MANWARING, WILLIAM.—"Reaping and mowing machines."

1. Machines with "flexible cutter bars" have two driving wheels, and, by preference, a gearing frame cast in one piece, so that the "bearings of the motion shafts are integral portions of the casting or castings of such frame, and the crank shaft is partially or wholly inclosed within such casting or castings." The lever which raises the cutter bar, &c. has on it a pall which falls into a notch on the frame and holds it up. To lower the lever, it is pushed a little further over, when a projection on the frame strikes the back of the pall and lifts it when it rides over the top of the notch in which it was held, a stud on the pall passing outside instead of within a groove in the side of the notch. Or the pall may be pivotted stiffly on the lever, so that it remains in an elevated position when once raised. A spring is mounted to counterpoise the weight of the frame when it is being lifted. "The joint which allows of the cutter bar yielding sideways is constructed of two cups, by preference with chilled surfaces, attached to or forming part of the gearing frame, between which cups is hung an extension of the shoe carrying the cutter bar; the pivots of this extension are also by preference chilled."

2. In machines having "rigid cutting bars, a trussed main framework" and "revolving rakes for delivering the crops," the inventor places "the wheel which actuates the rake shaft, and of which the said shaft is the centre, between the upper and lower portions of such trussed frame."

3. This head refers to improvements on No. 327, A.D. 1864, and is applicable to machines "with flexible or rigid cutter bars, having a manual delivery." The inventor says:—"I

"hinge or pivot the whole platform in the usual way, & that platform I make a slot in which I cause rake teeth to move from the dividing shoe across a portion of the width of the platform towards the raker and back again at intervals. I further hinge or pivot a portion of the said platform so that I can cause such portions to lift the cut crop clear of teeth previous to its discharge from the platform by the attendant." "The respective motions are so arranged that the grain is prevented falling into the teeth, while they are returning sideways towards the standing crop."

[Printed, 1s. Drawings.]

A.D. 1865, May 20.—No. 1396.

EDDINGTON, WILLIAM, junior.—"Apparatus for trenching and laying drain pipes."

"In laying drain tiles by machinery, it is usual to open the ground by means of a mole plough, and draw it and insert the drain tiles at same time, the mole being held by a single coulter or stem depending from a plough beam." A double plough beam is used by preference carrying two coulters, one behind the other, "and so disposed as to traverse and sever the soil at a distance apart, according to the width of trench to be made." The soil cut by the coulters "comes in contact with an inclined piece, which, as the plough progresses, lifts the severed soil, and leaving the trench desired." In the rear of the inclined piece is a curved guide or channel reaching to the same depth as the inclined piece, and this serves to deposit the drain tiles. "The sides of the trench are kept up by means of cheek plates which extend throughout the length of the inclined lift, as also the curved delivery piece which deposits the drain tiles. The plough is mounted on wheels and regulated in its height from the ground, by adjusting screws somewhat in the usual manner." By means of a screw, the front of the beam can be regularly raised or lowered to form an incline for the drain in level ground. A water tank is fitted so as to supply water to moisten the surface of the inclined plane. "Its operation is as follows:—When propelled through the ground, the two coulters make two vertical incisions in the soil to the required depth. The inclined lifter follows immediately behind and lifts the soil

“ of the soil forming the trench in which the tile depositor  
 “ follows. The drain tiles are placed on end by hand in a  
 “ vertical guide channel, which tiles by their own gravity  
 “ slide down the curved guide and take up a horizontal posi-  
 “ tion in the ground, end to end, and closely abutting one on  
 “ the other. The soil then falls in above the tiles, and the  
 “ draining is complete.”

[Printed, 10d. Drawing.]

A.D. 1865, June 1.—No. 1503.

BURGESS, WILLIAM JAMES.—“Reaping and mowing ma-  
 “ chines.”

The gearing for transmitting motion from the axle to the  
 knife is placed on the outer side of the wheel on that side of  
 the machine from which the knife projects, “so that it may  
 “ pass over the same line of ground as that over which a  
 “ track board or clearer at the outer end of the cutter bar  
 “ passes, thus there will be no cut crop lying on the ground  
 “ below the gearing, and hence the crank, which gives the  
 “ to-and-fro motion to the knife may be placed closer to the  
 “ ground than could otherwise be the case, and the connect-  
 “ ing rod which connects the knife with the crank pin will  
 “ be brought more nearly into a line with the knife.” The  
 gearing is arranged as follows:—“The wheels on which the  
 “ machine runs turn in one direction with their axle, but  
 “ when they move in the opposite direction they turn on the  
 “ axle by a ratchet movement. The axle is made to project  
 “ beyond the wheel on the side of the machine from which  
 “ the knife projects, and on this projecting end of the axle is  
 “ fixed a toothed wheel. On this end of the axle is also hung  
 “ an arm or frame carrying a pinion that gears with the  
 “ toothed wheel on the axle. When the machine is at work  
 “ the frame is held so as to bring this pinion below the axle  
 “ of the running wheels and somewhere in front of it.  
 “ Pivoting on the axis of the pinion is another frame, which  
 “ passes towards the back of the machine, and to the rear  
 “ end of this frame is hinged the cutter bar; this latter frame  
 “ also carries a short axis, on one end of which is a crank for  
 “ giving motion to the knife, and on the other end a bevil  
 “ pinion; this bevil pinion gears with a bevil wheel, which  
 “ is fast on the axis of the pinion that gears with the toothed



" wheel on the axle. When the machine is at work, the  
 " frame to which the cutter bar is jointed is by preference  
 " allowed to turn freely on the axis of the pinion above  
 " mentioned, so that the cutter bar may rest on the ground  
 " and follow its inequalities; it might, however, if preferred,  
 " be bolted to the frame which is carried by the axle, so as to  
 " retain the knife at any fixed distance from the ground.  
 " The frame which turns on the axle is provided with an arm,  
 " by which it can be turned around the axle so as to raise or  
 " lower the pinion carried by it, and by this means the fingers  
 " of the cutter bar can be caused to point more or less up-  
 " wards from the ground as desired. Provision is also made  
 " for lifting the frame to which the cutter bar is jointed, so  
 " as to raise the cutter bar entirely off the ground when  
 " desired." The above arrangement, though intended prin-  
 " cipally for mowers, is also applicable for giving motion to  
 " the knives of reaping machines, suitable alterations being  
 " made in the apparatus.

[Printed, 10d. Drawing.]

A.D. 1865, June 9.—No 1569.

HOLMES, JAMES, HOLMES, GEORGE THOMAS, and HOLMES,  
 FREDERICK ROBERT. — (*Provisional protection only.*)—" Horse  
 " hoes and drills."

The following is the whole Provisional Specification :—

" In horse-hoes and drills as heretofore constructed, the stalks  
 " of the hoes and the coultera of the drills have been affixed  
 " to levers acted upon by weights or springs. The present  
 " improvements consist in dispensing with levers and attach-  
 " ing the stalks or coultera to springs. For this purpose two  
 " or more transverse shafts are mounted in suitable bearings  
 " at the sides of the machine. Upon these shafts there are  
 " a number of carriers, to which one end of the springs are  
 " bolted, and to the opposite ends of the springs the stalks or  
 " coultera are affixed. Upon the upper side of each spring  
 " there is a slotted plate, held in position by the screw bolt of  
 " the spring; the sliding of this plate backward or forward  
 " regulates the power of the spring. The position of the  
 " hoes or coultera is governed by a lifting handle conveniently  
 " placed within reach of the operator."

[Printed, 4d. No Drawings.]

A.D. 1865, June 15.—No. 1618.

POITEVIN, VIRGILE. — "Propelling agricultural implements."

The system of working is applicable to all descriptions of implements. It is shown as applied to a plough. The traction rope is wound on a drum driven by a motor on one headland. The rope is fixed to the implement frame. Thence it passes to and round the drum. Thence it goes back to the implement, passes round a large drum and is wound on a small drum driven by the large one. In one direction the implement is drawn direct by the rope; in the other, it is to be moved by the rotation of the large drum on the frame which is transmitted to the bearing wheels. The implement is steered by adjusting the direction of the bearing wheels. The plough figured has its shares, &c. mounted on beams pivotted to the frame, so that each of the two sets comes into action alternately. It is also fitted with a harrow.

[Printed, 10d. Drawing.]

A.D. 1865, June 20.—No. 1660.

AUDINWOOD, MARK, the younger — (*Provisional protection only.*)—"Reaping and mowing machines."

The following is the whole Provisional Specification:—

"My invention consists in the employment in front of the  
 "driving wheels of reaping and mowing machines of a  
 "bracket or bar, or equivalent contrivance, carrying at or  
 "near its lower end a small wheel, which runs along the  
 "ground in advance of the driving wheels of the machine.  
 "The stem of the bracket or bar slides vertically in one or  
 "more bearings secured to the draw pole or to one of the  
 "shafts of the machines (where shafts are used), and at or  
 "near the upper end of the bracket or bar, or equivalent  
 "contrivance, or to a projection from the upper end, I hook  
 "the chain which suspends the knife or cutter frame of the  
 "machine. The bracket bar or equivalent contrivance is  
 "strengthened by a rod (capable of adjustment) and attached  
 "to or near the lower end of the bracket bar or equivalent  
 "contrivance, and at or near the fore end of the draw pole or  
 "shaft; the bracket or bar can be raised up and held so raised  
 "by a set screw when the machine is not in use, or is being

" drawn from place to place. When the machine is in use,  
 " and the chain is adjusted, the wheel will raise or lower the  
 " knife or cutter frame so that the machine will cut across  
 " ridges and furrows closer to the earth than heretofore, and  
 " there will be no necessity for repeatedly stopping it to  
 " adjust the knives or cutters to ridges or furrows, for when  
 " once set to the height required it will cut down into the  
 " furrows and clear the ridges without tearing up or sticking  
 " into them."

[Printed, 4d. No Drawings.]

A.D. 1865, June 27.—No. 1715.

BROOKS, WILLIAM.—(*Provisional protection only.*)—"Heating  
 " chisels, knives, plane irons, gonges, augers, steels, shears,  
 " scythes, and saws."

The objects to be heated are placed "in a highly heated  
 " tubular or hollow chamber, heated externally in place of the  
 " above-mentioned articles being heated by a direct contact  
 " with a fire." "It is desirable that the hollow tubular  
 " chamber should not greatly exceed the dimensions of the  
 " chisels or other articles to be heated thereon," and "it is  
 " also preferred that there should be several tubular chambers  
 " formed in the same block or mass, which is by preference of  
 " cast iron coated externally with fire-clay." "These tubular  
 " chambers are set over a fire or furnace and are heated  
 " thereby as evenly from end to end as may be, so that the  
 " chisels or other articles introduced therein may be uniformly  
 " heated from end to end. These tubular or hollow chambers  
 " are usually closed at the back ends and open in front."

[Printed, 4d. No Drawings.]

A.D. 1865, July 8.—No. 1815.

BYFORD, JOSEPH.—(*Provisional protection only.*)—"Reaping  
 " and mowing machines."

The inventor says:—

"The operation of cutting is performed in the ordinary  
 " manner of reaping machines. I dispose a horizontal board  
 " or platform, which extends to about one-third the breadth  
 " of the machine (length of the cut) behind the cutting knife  
 " and frame on the side next the standing crop. This platform

" is at about the level of the knife, and in form a right-angled  
 " triangle, the one side of the right angle abuts on the knife  
 " frame, the other extends backwards from said frame near  
 " the midbreadth thereof, while the third side or hypothe-  
 " nuse terminates in a raised plate or board standing up a  
 " considerable height in a vertical or nearly vertical position,  
 " by preference inclined a little backwards. From this plate  
 " I extend an arm or arms, which occupy a position somewhat  
 " in the direction of the breadth of the machine. I prefer to  
 " use two or three. From their supporting plate these arms  
 " incline in the backward direction and are disposed one  
 " behind the other, the upper one being a little in advance of  
 " the one below it. These arms are fitted so as to be adjusted  
 " more or less forward or inclined in position as may be  
 " required." By this apparatus the cut crop is carried later-  
 " ally a considerable distance, say a third of the breadth of the  
 " machine," and " is toppled over by the arms, delivered, and  
 " laid in a swathe on the ground."

" To deliver the crop in sheaves the parts last herein de-  
 " scribed may be removed and others substituted " and " the  
 " machine may be used with side delivery (in swathe) for  
 " mowing by adapting the parts above described to the crop  
 " to be cut."

[Printed, &c. No Drawings.]

A.D. 1865, July 10.—No. 1824.

UNDERHILL, WILLIAM SCOTT, CORDEN, ARTHUR HOPKINS,  
 and CORDEN, JOHN.—(*Provisional protection only*)—"Reap-  
 " ing machines."

The following is the whole Provisional Specification:—

" Our invention consists in a new arrangement of the tail or  
 " delivery board by which the grain or other crop as it is cut  
 " is laid in a continuous swath or row without the aid of any  
 " other mechanism. We propose to dispense with the ordi-  
 " nary tipping board, and as the cutter bar would then require  
 " support, we employ a stretcher bar or bars fixed in such  
 " position that it or they shall not in any way interfere with  
 " the crop or with the operations of the raker if one be  
 " employed. For a single horse machine we take a board  
 " of about seven feet in length and nine or ten inches wide at  
 " one end by about three-quarters thick, the other end being

" tapered to about three or four inches in width, this end is  
 " hinged to the frame of the machine on the opposite side to  
 " the main framework, the wide end runs on the land about  
 " four feet. At the tail end of the board is attached a guide  
 " bar or rod similar to what is commonly used on an ordinary  
 " grass mowing machine, to the opposite end of the board we  
 " attach a platform of metal or other suitable material, this  
 " platform is also fixed or hinged to the frame or finger bar  
 " through which the knife works, and is slightly dished or  
 " curved in a peculiar form so as to elevate the ears of the  
 " cut grain, and as the machine is drawn forward the peculiar  
 " form of the platform and guide bar or rod causes the neces-  
 " sary quantity of grain to turn partially over and deposit  
 " itself in a continuous swath or row."

[Printed, 4d. No Drawings.]

A.D. 1865, July 18.—No. 1867.

ARMITAGE, JAMES.—" Drills for sowing seeds and deposit-  
 " ing manure."

The improvements consist in the addition of a pair of crush-  
 ing rollers beneath the compost hopper. The manure passes  
 through the rollers and is crushed thereby. The rollers  
 may be fluted or plain, and have scrapers to clear them. They  
 are adjustable as to distance apart. They are suitably driven  
 from the usual driving gear.

[Printed, 8d. Drawing.]

A.D. 1865, August 2.—No. 2004.

HODGSON, CHARLES.—" Apparatus for treating peat in bogs  
 " and obtaining it therefrom, also applicable to tilling and  
 " cultivating land."

A tramway is laid down across the ground to be operated  
 on, and on this tramway a truck is arranged to run. The  
 truck carries " a beam or girder, of such form, proportions,  
 " and strength as shall be capable of reaching across the  
 " entire width of the piece of bog to be operated on " Har-  
 rows are connected to the beam, and the whole is moved either  
 by animal power or an engine. Next, ploughs or harrows are  
 substituted for the harrows which " turn in " the peat already  
 pulverised by the harrows, and cause it " gradually to ap-

"proach the railway." An implement is also described, which is to be used for scraping the loosened peat towards the railway. A scraping blade is mounted in a frame with one wheel like a wheelbarrow, and two pairs of handles behind. It is drawn in towards the railway by the engine, and is guided by a man who presses down the upper handles. The lower handles are used in wheeling the apparatus out of the extremity of the field, when the scraper has to be kept off the ground.

[Printed, 8d. Drawings.]

A.D. 1865, August 30.—No. 2235.

GILBERT, SAMUEL and GILBERT, SAMUEL, the younger.—  
"Implement for cultivating or tilling land."

An upper frame carrying tines is mounted on a lower frame with wheels so as to rise and fall thereon. Both frames are triangular; there are two wheels behind, and a pair of wheels on a standard at the apex in front. The moveable frame is raised by a jointed lever which lifts both ends together. The frames are connected by "draw bars." The lower frame is slightly adjustable in height. The "cutters or shares of the tines are of a rectangular form." "The cutting edges are of a rectangular form, and are similarly formed at top and bottom," so that they can be reversed when worn.

[Printed, 2s. Drawings.]

A.D. 1865, September 9.—No. 2310.

BRIGHAM, JOHN and BICKERTON, RICHARD.—"Reaping and mowing machines."

The invention refers to improvements on the "Buckeye" machines. The main frame is "of cast iron in one piece, of an open rectangular shape," and has "a horizontal web and deep vertical feathers or flanges all round." The sides of the frame "run parallel and close to the main wheels, and have the two bearings of the main shaft formed in them." The large (internal) spur wheel is formed with a rim which covers its own teeth and those of the pinion gearing therewith. The whole of the frame is covered by a wooden platform jointed to the front part. This platform carries the driver's seat, which is mounted on "two duplex springs."



Near the seat is a lever acting on a spring clutch for throwing the cutter out of gear. This works through a slit in the platform with notches to hold the lever in various positions. When the machine is used for reaping, and there is an attendant to rake the cut crop off the platform, there is a guard over the main wheel, and the attendant's seat is above the guard.

A tilting platform may be used, or a "low and nearly flat" horizontal platform with a vertical segmental side, "quadrant-shaped and fixed so as to deliver at the side. A moveable reel may be fitted in brackets on the frame, or on part of the finger bar. To prevent the movement of the finger bar tightening and slackening the chain, "it is carried down and round "two pulleys in a horizontal line with the actuating pulley on "the main shaft." "The gathering arms are curved forward "at their ends."

Reference is made to No. 751, A.D. 1863, it being stated that the "pall and segmental ratchet mechanism" for delivering the finger bar at different heights, which is described in the Specification, is to be used in the improved machine.

[Printed, i.e. Drawing.]

A.D. 1865, September 11 -- No. 2324.

BURGESS, CHARLES THOMAS.—Reaping machines.

A "scraper bar" is mounted on a vertical shaft at one of the corners of the platform. This shaft being suitably actuated, it causes the scraper to travel backwards and forwards over the platform. The scraper is of such shape that it passes under the crop as it moves forward, and carries the crop with it as it moves back. It may have teeth upon it to assist its action. The reel is formed with one of its beaters "extending beyond "the others" and with rake teeth thereon. The "scraper" is worked by a bell-crank lever driven from the reel shaft, and its motion is timed so that just after the toothed beater has thrown the crop behind the scraper the latter is set in motion, and carries the crop off the platform. The platform is covered with sheet zinc to assist the delivery of the crop.

A tilting platform may be used, in connection with a reel beater of the sort described above. This platform is arranged "to work automatically, just when the projecting beater of "the reel comes round, and then this projecting beater passes

" ing immediately over the cutters strikes the cut crop and  
" sweeps it clean off the platform." The platform is actuated  
from a cam on the reel shaft.

[Printed, 2s. 4d. Drawings.]

A.D. 1865, September 12.—No. 2331.

BADGER, JOHN, and STEFF, JOHN HENRY.—(*Provisional protection only.*) — "Harrows, cultivators, and other similar  
" agricultural implements."

Several methods of constructing harrows are described.

1. The harrow is formed of "nearly straight diagonal bars,"  
" the parts of the bars where they cross each other being bent  
" at an obtuse angle out of the line of the other part." The  
bars are slotted out where they cross, and the tines are formed  
so as to embrace the bars and clamp them at the points of  
junction.

2. Bars of a "zig-zag form" may be used, the angles being  
brought together and united by the tines, "a parallel bar  
" being situated between them."

3. "Zig-zag bars" are passed through holes in a series of  
" transverse parallel bars situated in a vertical plane, the  
" angular parts of the zig-zag bars being held together by  
" the holes in the transverse bars." The tines are driven  
" between those portions of the zig-zag bars situated between  
" the transverse bars." The transverse bars may also be  
arranged "in a horizontal plane, one bar of each pair being  
" over and the other bar under the opposed angles of the zig-  
" zag bars." The tines are then passed through holes in the  
transverse bars.

[Printed, 4d. No Drawings.]

A.D. 1865, September 22.—No. 2422.

SHELDON, JOSEPH —(*A communication from Albert Goodyear.*)  
—"Machines for binding grain."

The invention "consists in automatic mechanism which  
" first twists a band of straw, then gathers the grain into a  
" bundle, places the said twisted straw band around the said  
" bundle, twisting the two ends of the said bands together to  
" secure the bundle." A hopper is fitted across the machine,  
and in this straw is laid transversely. At the bottom of this

hopper is a shaft with teeth thereon, and this revolves through part of a circle at intervals and delivers a sufficient amount of straw to form a band. This falls into a box below, at one end of which is a gripper which holds the end of the band and at the other a revolving hook or "twister" which twists the band. As soon as the band is formed, the box is traversed forward, and a curved arm attached thereto receives a bundle of corn on the platform. This arm then makes a partial revolution, carrying with it the "twister," and by this means the two ends of the band are brought together. A second "twister" nates these by twisting their ends together. The box and "gatherer arm" then retires, leaving the bound sheaf on the platform over a trap which opens and allows it to fall through. Instead of the hopper above mentioned, the straw may be laid in by hand. The band may be twisted at both ends instead of one only.

[Printed, 2s. 8d. Drawings.]

A.D. 1865, October 12.—No. 2630.

LERENARD, AUGUSTE AIMÉ. — "Indian-rubber mastic or "cement"

The materials are:—

1. India-rubber, dissolved in "thick tar oil obtained in the "purification of illuminating gas."
2. Rag paper pulp.
3. "Potter's or other clay."
4. Colouring matter as required.
5. Flowers of sulphur.

These are mixed together and incorporated by passing between rollers. "This cement may be used generally as "waterproofing or anti-hygrometric coating, but for muc "purposes it is composed of indian-rubber and clay only "various proportions." "It can be very usefully employed "for coating fences or agricultural implements."

[Printed, 10d. Drawings.]

A.D. 1865, October 12.—No. 2634.

CAMBRIDGE, WILLIAM COLBORNE — "Clod crushers and "chain harrows."

1. Wheels for clod crushers are made with teeth on their peripheries. The teeth are made with "thin bevelled

“ edges ” and leave the ground fit for sowing. “ Every other  
 “ wheel can be made a little larger in diameter, which will  
 “ give it a self-cleaning action.”

2. This head “ consists in the substitution of points or tines  
 “ in the place of the working parts or links that are placed  
 “ across chain harrows, so arranged that each tine and work-  
 “ ing link will take a different line of action.” The inventor  
 prefers “ to use the ordinary working link running from front  
 “ to back of the harrow.” Harrows of this sort are coupled  
 by long links attached to the “ spreaders ” or whippletrees.”

[Printed, 8d. Drawing.]

A. D. 1865, November 4.—No. 2846

JEMMETT, ALEXANDER. — “ Apparatus for scattering lime,  
 “ manure, &c.”

Two hoppers are mounted on a suitable wheeled frame, from  
 the wheels of which motion is communicated to fluted rollers,  
 one under each hopper, which receive manure, &c., from the  
 hoppers and deliver it to a pair of revolving wire cylinders  
 below by which it is thrown in the state of fine powder through  
 apertures in the bottom of the casing surrounding the apparatus.  
 Liquid manure, &c., is delivered through pipes to the cylinders.  
 If required, one cylinder may be supplied with water and the  
 other with lime, &c., where the object is to cause the lime to  
 adhere to the leaves of the plants and thus destroy the turnip-  
 fly, &c. Liquid manure may also be supplied through per-  
 forations in the bottom of the hoppers. Proper appliances are  
 provided for throwing the apparatus into and out of gear. By  
 using “ double tines ” instead of the revolving cylinders, the  
 manure, &c., can be thrown into ridges.

[Printed, 10d. Drawing.]

A. D. 1865, November 8.—No. 2875.

MANWARING, WILLIAM. — “ Reaping and mowing ma-  
 “ chines.”

The invention refers to a modification of the track clearer  
 described in No. 1503, A. D. 1863. The track clearer is made  
 “ wholly or partially of bars, one or more of which trail or  
 “ nearly trail on the ground, and the remaining or lateral  
 “ bars (which replace the ordinary track clearing board com-  
 “ monly used in mowing machines) incline backwards, up-

"wards, and away from the standing crop." "The bars are connected together by an angle plate at the cutter bar hinged to the cutter bar. The effect is stated to be "to turn aside and more or less completely to turn over into swathe the cut crop."

[Printed, 6d. Drawing.]

A D. 1865, December 6.—No 3142.

BAMLETT, ADAM CARLISLE. — "Reaping and mowing machines."

1. In combined reaping and mowing machines an arrangement is adapted for giving a quick speed for mowing and a slow one for reaping. For this an internal spur wheel for mowing and an external spur wheel of smaller diameter for reaping both gear into the same pinion.

2. There are "one or more recessed collars on the spindles so as to lubricate the spindles."

3. The "short pole which carries the front wheel" in combined machines, is so fitted that "the front wheel can be placed nearer to the knife for mowing and further from the knife for reaping." This is effected "by attaching the rear end of the short pole to the machine by a stout bolt, in which it can rotate, and describes a small portion of a circle sufficient to make the required adjustment of the front wheel; or it may be accomplished by providing two holes for the bolt to work in."

4. A "reversible reaper" which does not require to be turned at the end of the field is described. It has two cutters and crank shafts which can be put in and out of gear. The pole is attached to the centre of the frame by a universal joint, and is held at either end as required by a catch. There is a "hinged shield fitted to the side of the platform next the standing corn." This is turned either way as required.

[Printed, 1sd. Drawing.]

A.D. 1865, December 23.—No. 3334.

HURN, GEORGE, and HURN, DANIEL.—"Obtaining and employing continuous lengths of tanned leather."

Among the very numerous applications given for the invention, it is stated to be available for making "lines, cords,

“ropes, or threads for drags, falls, waggons, carts, harrows, ploughs,” and “agricultural purposes.”

The following is the description given :—

“Having selected the prepared skin or hide, and pared or rounded off the edges or corners, the continuous lengths are cut therefrom by causing the knife or instrument to traverse the entire surface of the skin, so as to divide it in an endless piece or coil, which is subsequently submitted to a longitudinal stretching, damping, greasing, or hammering, as may be found necessary.” The operation may be effected by any suitable apparatus.

[Printed, *8d.* Drawing.]

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1866.

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A.D. 1866, January 3.—No. 18.

BONNEVILLE, HENRI ADRIEN.—(*A communication from Alfred Jean Baptiste Bruillon and Pedro Martinez Lopez.*)—(*Provisional protection only.*)—“Apparatus for sowing grain or seed.”

No description of the apparatus is given, the only explanation of the invention consisting of a drawing with references stating the uses of the various parts. The machine is mounted on bearing wheels, on the axle of which is a pin-wheel acting on a lever pivotted above. The lever apparently operates a slide with openings therein worked under a hopper, the bottom of which has corresponding apertures. Seed or manure is thus delivered from the hopper to a seed tube leading to a furrow made by a coulter. A rake follows and covers up the seed.

[Printed, *8d.* Drawing.]

A.D. 1866, January 3.—No. 20.

SHEPPARD, GEORGE.—(*Provisional protection only.*)—“Rollers for rolling or crushing land.”

The invention consists in mounting the several rollers forming the implement so that they can rise and fall independently



of one another, and thus adjust themselves to inequalities of the ground. Each roller is mounted on a smaller concentric disc which is slotted across, so that the axle, which is square may slide laterally therein, but not revolve. Washers or friction rollers may be used to lessen the friction between the roller and the inner disc.

Or the spindle may be circular, and then the inner discs are mounted "as loose excentrics upon the same."

Or all the rollers may be made with holes much larger than the spindle, so that they can rise and fall thereon.

[Printed, 4d. No Drawings.]

A.D. 1866, January 27.—No 266.

SPENCER, JOHN.—"Machinery for rolling and clod crushing."

"The improvements are effected partly in the form of the periphery of the rollers, and partly in the mode of constructing the implement therewith. The cylinder which forms the roller or crusher is divided into a number of sections or narrow wheels mounted upon a central axis and turning thereon. The axis may be either fixed or allowed to revolve partially with the roller, but in either case the roller sections or wheels are free to rotate independently of each other; their peripheries are formed with spiral or angular ridge and valley surfaces, being from right to left in one wheel, and from left to right in the next, alternately, thereby producing a zig-zag or ridge and valley surface of the land both longitudinally and transversely." "For crushing clods, where the transverse section of the land is ridge and valley to commence with, as in the case of carted-up potatoes, where it is desirable to preserve each surface" the inventor makes the wheels "of unequal diameters, dividing the series by small spiked wheels or rollers."

[Printed, 10d. Drawing.]

A.D. 1866, January 29.—No. 286.

ROBERTSON, JAMES.—Excavating and dredging machinery

Among the apparatus described is an implement for forming drains. This consists of a rolling cutter with a sharp edge. This is mounted in a suitable frame and drawn over the land

by horse, steam or other power. The rolling cutter may be mounted in various ways. Instead of being mounted on a central axle, it may be fitted between grooved drums, which support and impart motion to it. Or it may be mounted on a drum to which motion is given by ropes passing over it (as in "parbuckling") and worked by a windlass or by horses, &c. Or a hollow drum with winding gear within it which winds on a fixed rope may be used. Or the cutter may be formed so as to carry on it drain tiles which it forces into the ground. Or horse gear may be adapted to the machine, the lever being mounted on a central vertical shaft; a bridge which covers the cut drain is dragged along behind the implement, so that the horses may pass over it. Or a steam engine and boiler may be mounted on the frame, and used to drive the implement.

Bearing wheels may be employed to raise the roller off the ground. To weight the roller water may be poured therein. The wheel may be of any form, even "square," instead of "wedge-shaped."

[Printed, &c. Drawings.]

A.D. 1866, February 12.—No. 431.

PILBROW, JAMES.—(*Complete Specification but no Letters Patent.*)—"Applying to land liquid sewage," &c.

The liquid sewage is conducted under pressure through a main pipe to the place where it is to be used, and there it is distributed through earthenware pipes laid in the ground at a depth of 15 inches, more or less, and at suitable distances apart. The joints of the distributing pipes are not packed, and if necessary the pipes themselves may be perforated, so that the sewage is forced out into the soil. The field may be drained in the usual manner, at a depth below that of the distributing pipes.

[Printed, &c. Drawing.]

A.D. 1866, February 20.—No. 528.

WELLS, WILLIAM MIRABEAU.—(*Provisional protection only.*)—"Double-action harvesting and mowing machine"

The driving gear operates a vibrating lever and this gives an alternate rotary motion to a pinion gearing with two racks,

one on each side thereof. These racks drive two cutters, consisting of blades "of steel or bronze, on which are fixed, "by means of one or two screws, triangular knives." "A "cast-iron regulating pulley adjusted on the driving shaft "so as to move freely and with gentle friction, turns on the "ground which supports it, and thus follows the inequalities "of the soil and causes to rise and descend with it a move- "able plate or table, itself guided in the movement by two "cast-iron grooved guides." The gearing is boxed in; the cutters can be removed for travelling; the driving wheels are "full or solid."

[Printed, *ad.* No Drawings.]

A.D. 1866, February 23.—No. 567.

FISHER, NICHOLAS.—(*Provisional protection only.*)—"Ma- "chinery for cultivating land."

In steam ploughing, according to the system described, the apparatus is arranged so that an engine moving along a "midland" in the centre of the field, with an anchor carriage on each headland, causes one implement to move toward the engine while another on the opposite side of the engine is moving from it. The engine "is either locomotive or " "arranged to move itself from one end of the field to the "other by winding up a rope or otherwise." The engine "is "fitted with and drives a drum or double pulley, the shaft "axis of which it is preferred should be horizontal. Two "endless ropes are worked by this pulley or drum, there "being two grooves or recesses in the periphery for this "purpose."

[Printed, *ad.* No Drawings.]

A.D. 1866, March 1.—No. 633.

LOOMES EDWARD.—(*Provisional protection only.*)—"Machinery "for planting potatoes."

The following is the whole Provisional Specification—

"This invention has for its object improvements in ma- "chinery for planting potatoes. For this purpose, I employ "a carriage mounted on wheels and carrying a hopper, in "which the seed potatoes are placed. At the bottom of the "hopper is a ledge on which the potatoes rest, and from which "they are taken as required by forks mounted on an axis

immediately behind the hopper. The forks are raised in succession by tappets on a tappet shaft, which is driven by a pitch-chain from the carrying wheels or in other convenient manner. Each fork as it falls back, pierces and takes upon its prongs one of the potatoes resting on the ledge and at the bottom of the hopper, and next time the fork is raised, this potatoe is lifted by it until when the fork comes near the upper end of its stroke, the potatoe comes against a stop, which pushes it off the prongs, and it falls down through a guide hopper, which leads it into a compartment formed in the periphery of a drum. This drum is connected with the carriage, and rolls on the land, it has four or other convenient number of compartments in it, and each compartment as it comes to the top of the drum has a potatoe fed into it in the manner already described, and then as the drum moves on, each compartment as it comes to the bottom, allows the potatoe to drop out on to the land, thus the potatoes are deposited on the land at very regular intervals. Selecting forks as above described, may be applied in combination with other instruments for dropping the potatoes on to the land. The land should be prepared to receive the potatoes by ploughing it into furrows, and after the potatoes are deposited, a plough is employed to cover them over, these ploughs or either of them, may, if desired, be coupled with the planting machine."

[Printed, 4d. No Drawings.]

A.D. 1866, March 3.—No. 657.

BISCHOFF, JOHN.—(*A communication from Robert Crossbair.*)  
—“Steam cultivators”

A frame carrying a steam engine is mounted on bearing wheels driven by the engine, and has a steering wheel in front. A vertical shaft in the rear carries on its lower end a horizontal wheel, on the rim of which vertical digger blades are mounted. These are pivotted to the rim, and secured each by a wooden pin, which breaks if the blade meets with any impediment. A similar digger wheel is mounted on each side, and these are driven by chains from the first-named. Coulters or “shares and scrapers” may be used, these last being adjustable. Racks are provided for raising and lowering the digger frames, and by clutching various pinions on the first motion

shaft to the same, different speeds can be obtained for the machine.

The machine may be used for cutting ditches, one digger frame only being used. There is then an endless chain of buckets, mounted so as to collect and raise the earth loosened by the diggers. This delivers the earth to receptacles on the frame, or to inclined planes which throw it off at the sides.

By removing the digger frames, &c., the engine may be used separately.

Various improvements in the engines are described.

[Printed, 2s. 6d. Drawing.]

A.D. 1866, March 8.—No. 710.

RUSS, WILLIAM and WEDLAKE, THOMAS WILLIAM.—(*Provisional protection only.*)—"Apparatus for distributing water and "liquid manure."

Improvements on No 100, A.D 1865. To keep the distributing pipe clear, it has slots cut therein at intervals along its length. A sliding bar operated by a crank, &c., has on it brass "tongues," which fit into the slots and clear them. Or the pipe may be perforated with round holes into which pins on a rocking bar pass to clear them. Solid manures may be introduced into the liquid by causing the liquid to pass through a tank containing the manure. A corrugated roller working in the tank delivers the manure regularly to the liquid. One of the bearing wheels of the machine can be slidden along its axle to vary the width between the wheels. There is "a pole at "either end" from which the horse draws alternately. "In "adapting steam to traverse the drum which carries the hose "pipe and the distributing pipe," a boiler is mounted on a pair of wheels, one of which is driven by a steam cylinder on the frame. There is also a steering wheel, and the relative positions of this and the bearing wheels can be altered by means of a rack. The drum is driven from the steering wheel, which receives its motion from contact with the ground. "The hose pipe is connected with the hollow axle of the drum, and from "the axle depends a pipe which conducts the liquid to the "distributing pipe." A pump carried by the machine may be used for watering standing crops. A drill may be attached to the frame of the machine.

[Printed, 4d. No Drawings.]

A.D. 1866, March 13 —No. 755.

**BOOTH, GEORGE** —“ Reaping hooks and sickles.”

The following is the whole Specification :—

“ Heretofore in the manufacture of such implements the edge part has generally been of sheer steel welded to a back of wrought iron, which was then reduced to proper form by hammering, or in some cases cast steel alone has been used for the purpose, which was also reduced to the form required by the hammer. Now my improvements consist in the employment of cast steel, which I first reduce by means of rollers into bars, with thick and thin edges, to the breadth and thickness required, afterwards the bars are cut into suitable lengths, and bent to the form required by either hammer or other mechanical means.

“ By means of this invention a superior implement is produced at less cost than heretofore.”

[Printed, 4d. No Drawings.]

A.D. 1866, March 15.—No. 772

**EVANS, OMBRON COFFEEN.** — (*Provisional protection only*)

“ Digging machinery.”

A number of digging wheels are mounted on a shaft in a frame drawn by horses. Each wheel has pivotted to its rim a number of digger blades, the butt ends of which rest against a fixed cam surface which throws them in and out of action. By its means they are suddenly raised as they leave the ground, thus causing them to throw over and break the clods. they are then allowed to drop with their points down to clear themselves, and then again raised and held close against the periphery of the wheel. When each blade has been carried round nearly to the point where it enters the earth, the cam surface allows it to fall point downwards, and a fixed guide, acting against a projection on the stalk of the blade, holds it in position to enter the ground. By shifting the cam surface the blades can be turned up against the wheel at the lowest point of its circumference, so that the machine can be transported from place to place, or used as an ordinary roller.

[Printed, 8d. Drawing.]



A.D. 1866, March 27 —No. 889.

RAWSTHORNE, JAMES, and BAYLEY, EDWARD HOBBS —  
 " Carts for distributing water, liquid manure, and other fluids  
 " over roads and lands "

1. The "branch" pipe, leading to the distributing pipe, is circular in transverse section, but divided by "a metallic longitudinal diaphragm." The distributing pipe "is double, and consists of one cylindrical pipe above another and separate from it, each pipe being in exclusive communication with one of the chambers of the main or 'branch' pipe." A valve is fitted so that the water, &c., is admitted to either or both pipes, and as one of the distributors has a greater number of holes than the other the quantity discharged can be regulated.

2. Vulcanised rubber, &c., may be fitted as a spring between the cart body and frame. The rubber may be fitted in a groove in the frame, or it may be bolted to the frame and the body.

3. The body of the cart is "galvanised "

4. The interior is lined with "Spence's" composition, or other suitable composition, either wholly or in parts.

[Printed, 4d. No Drawings.]

A.D. 1866, March 27 —No. 898.

LIERNUR, CHARLES THIEME. —Treating sewage.

The greater part of the Specification deals with a system of collecting sewage. A method of applying sewage to land is also described. A barrel filled with sewage is fixed on the frame of a plough, and a tube therefrom discharges the sewage into the furrow. "Two scrapers level again the ridges of the "cast-up earth." For "manuring meadow land," "instead of a ploughshare a knife is used, standing upon a broad "hollow foot" through which the sewage flows from a barrel mounted as above. When required, a "small forerunning "knife" is placed "in front of the main knife, moving up "and down vertically about 3 inches." This is worked by a small crank.

[Printed, 10d. Drawing.]

A.D. 1866, April 19.—No. 1096.

LORD, EDWARD, and NORFOLK, RICHARD.—Reaping machines.

The improvements refer to a method of tightening the chains used for communicating motion in reaping machines and other agricultural machines. One of the chain wheels is "fixed to an axle working in a hole placed eccentrically in a circular bush fitting into a fixed socket. By turning this bush partly round, the distance between the two centres of the wheels is varied; or the same object may be accomplished by fixing the axle in a sliding bearing regulated by set screws or other equivalents. In both these cases universal joints must be applied to the axle that is moved to compensate for the varying positions of the journal. When the centres of the driver and driven wheels are fixtures, the universal joints are dispensed with, and the chain is tightened by a roller on a stud, the position of which is moveable on a lever or in a slide to take up the slack of the chain."

[Printed, 1s. 4d. Drawings.]

A.D. 1866, April 27.—No. 1192.

HOWARD, JAMES, and TENNEY, EDWARD BOUSFIELD.—  
"Working steam tilling implements."

The invention relates to a method of working two tilling implements simultaneously "on what is known as the 'double system.'" The implements are worked by two engines, which are placed at opposite sides of the field, and "draw the implements to and from a given line dividing the field transversely into two parts." "If one side of the field is stiffer than the other, the division line may be drawn nearer to one or other of the land's ends so as to equalize the work of each engine." Each engine has two winding drums, "which are geared to the driving shaft independently of each other, and alternately haul in and pay out the traction ropes." The traction ropes are connected to the drums and to the implement and pass the whole distance across the field.

[Printed, 6d. Drawing.]

A.D. 1866, May 5.—No. 1280.

CRISPIN, WILLIAM HENRY.—(*Provisional protection only*.)  
 " Steam roller for agricultural purposes."

The roller is composed of a cylinder formed with rings of teeth on its internal surface. A steam engine is attached to a shaft mounted within the cylinder, and drives cog-wheels gearing with the teeth on the cylinder. This action causes the cylinder to revolve. There may be several cylinders connected together, each of such cylinders being furnished with one or more toothed rings in the interior thereof, gearing into toothed or cog wheels actuated by the steam engine." The roller may be guided by altering the direction of motion of the several rollers, or by a steering wheel

[Printed, 4d. No Drawings.]

A.D. 1866, May 14.—No. 1373.

BOVILL, GEORGE HINTON.—" Applying sewage to land "

" This invention consists in distributing sewage to agricultural land by means of subsoil irrigation through suitable pipes laid in the land, which pipes are arranged to serve the double purpose of subsoil irrigation and as a means when not so employed of draining the land; these pipes are connected with field service mains and outfall pipes, provided with suitable sluices or valves to close or open the outfall pipes and field service supply pipes, so that the supply of sewage for subsoil irrigation and the drainage of the land may be regulated in respect to each section or part of the land at pleasure. The sewage is to be applied under pressure to make it permeate the soil and rise through the earth upwards to the surface. The sewage previous to its application is to be deprived of its solid matter by filtration, or by subsidence in reservoirs used in combination with this process. These collecting reservoirs, where practicable, are to be constructed on a sufficient elevation above the land to be irrigated, and so as to give the necessary pressure to force the sewage water flowing through the subsoil pipes through the earth upwards to the surface, or the requisite pressure may be obtained by steam or other power "

[Printed, 10d. Drawing.]

A. D. 1866, May 18.—No. 1414.

BÜNGER, WILLIAM. —(*A communication from Moritz Poll and William Angerle*)—(*Provisional protection only*)—"Machines  
" for cutting and harvesting grain and grass crops."

The implement is to be worked "by hand or by one horse."  
A pair of bearing wheels supports a frame with a reciprocating cutter mounted along the front thereof. A cam wheel with radial teeth is fixed on the axle of the bearing wheels. This gives a reciprocating movement to a sliding frame surrounding the wheel, and this transmits the motion through an arrangement of levers to the cutter. The height of the cutter is regulated by a pair of small wheels. "If used for cutting  
" grain a light platform supported upon the main frame of  
" the machine in such a manner that it may easily be tilted  
" or lifted by the attendant and the grain delivered to either  
" one side or the other is applied."

[Printed, 1s. Drawings.]

A. D. 1866, May 22.—No. 1438.

HOMER, GEORGE WOOD—"Improvements in breaking, pulverizing, or scarifying land, and in apparatus employed for  
" such purpose."

The invention consists in attaching to a hand or steam plough a "breaker, cutter, or instrument of any well-known  
" construction and of such a form as will follow immediately  
" behind or by the side of the turnfarrow and break or pulverize each furrow as it is turned and bring to the surface  
" all couch grass or other roots and weeds." The form of the implement may be varied and "will depend in a great measure  
" upon the nature of the land and other circumstances under  
" which it is to be employed."

The following is the form described:—

"The apparatus consists of three parts, namely, the shaft or  
" bar, the connecting rod, and the breaker or knife. The  
" shaft or bar is to be attached to the beam of the plough at  
" about the same place and by the same means as the ordinary  
" skim coulter. This shaft or bar projects downwards from  
" the beam, and is curved or otherwise made in such a form  
" that its lower end shall lie in the last furrow," "and to  
" this end is jointed the connecting rod, which is of such a

" length that the breaker or knife which is attached to its  
 " other end shall follow at a certain distance (say about four  
 " inches) behind the turnfurrow."

The shape of the breaker may be varied. It may be about  
 ten inches long and slopes backwards at an angle of about  
 forty-five degrees.

[Printed, 6d. Drawings.]

A.D. 1866, May 23.—No. 1443.

JAMES, ISAAC.—(*Provisional protection only*)—Clod crusher

The following is the whole Provisional Specification:—

" This improved clod crusher consists of a series of wheels  
 " or narrow rollers mounted on a horizontal shaft, the ends  
 " of which turn in suitable bearings on a frame to which are  
 " attached a pair of shafts for drawing. Upon the periphery  
 " of these wheels or rollers, at suitable intervals (say four and  
 " a half inches asunder), are placed projecting round-pointed  
 " cones in a diagonal position, which cones when the roller is  
 " drawn over the ground crush and pulverize the clods of  
 " earth without being liable to become clogged."

[Printed, 4d. No Drawings.]

A.D. 1866, May 26.—No. 1474.

ROLLINS, JOHN GUSTAVUS.—(*A communication from Alvan  
 Brown*)—Horse rakes.

The teeth are of wire, on a square bar parallel to the wheel  
 axle, " the said teeth being coiled once or twice around the  
 " head as usual, in order that they may have a certain degree  
 " of elasticity." A short arm is mounted on this head and  
 to it an arrangement of levers is so connected that pressure on  
 one lever raises the teeth, or the other depresses them. A  
 rope is carried along the teeth, " the rope being either looped  
 " around the teeth or the teeth pass between its strands so  
 " that the rope may be raised and lowered on the teeth." This  
 prevents the hay, &c. from passing too far up the teeth. By  
 adjusting one of the levers the height of the teeth can be  
 regulated.

[Printed, 6d. Drawings.]

A.D. 1866, May 29.—No. 1490.

MAYNARD, ROBERT, and MAYNARD, ROBERT, the younger.  
—Horse rakes.

The object of the invention is to enable the rake to be raised by the power which draws it. Two methods of accomplishing this are described. (1.) A sliding bolt on the frame is shot between two of the spokes of one of the bearing wheels by the action of a lever, worked by a cord by the attendant. The wheel in revolving thus carries the rake with it to a sufficient height, when the bolt is withdrawn, and the rake falls. (2.) The bearing wheels by suitable gearing wind up a weight which is let fall at proper intervals by a catch, and the weight acts to raise the rake.

[Printed, 8d. Drawing.]

A.D. 1866, June 5.—No. 1551.

FARMAB, EDWIN.—“Apparatus to be used in training or  
“growing hops.”

There is “at each end of each row of hops a strong pole  
“somewhat similar to the ordinary telegraph poles, which  
“said poles are supported firmly by stays. At the top of each  
“pole is a horizontal cross-piece. From the ends of the cross  
“piece of one pole to the ends of the cross piece of the other  
“poles two horizontal wires situated parallel and in the same  
“horizontal plane are stretched and secured, and near the  
“bottom of each pole is a third stretched wire extending  
“from pole to pole. To these three horizontal wires other  
“and nearly vertical wires are joined, the lower end of each  
“vertical wire being joined to the lower horizontal wire, and  
“the upper ends of the said vertical wires being joined alter-  
“nately to one or other of the two upper horizontal wires.  
“Instead of one pole at the end of each row of hops with a  
“cross piece at top, two poles may be employed at each  
“end.”

[Printed, 8d. Drawing.]

A.D. 1866, June 14.—No. 1621.

WHITAKER, JOHN.—“Reaping and mowing machines.”

1. There is, “in addition to the ordinary cutter bar, an  
“auxiliary cutter bar which is fixed in the finger bar so that



" the cutting edges are protected by the 'fingers,' the ordinary cutter bar will as usual slide within or upon the finger bar, and be moved to and fro by a crank." "The two cutters will act as a pair of shears." "The auxiliary cutter bar is fixed so as to be readily removeable for sharpening."

2. For raising and lowering the cutter bar, the inventor says—"I affix the finger bar to an axis which is supported in bearings carried by the frame to which the driving axis and gearing are attached, to the axis carrying the finger bar I affix a lever, which by means of a chain passing partly around suitable pulleys is connected to a quadrant & a lever handle, which is capable of being fixed in any desired position."

3. The bearing wheels have flanges to assist the running of the machine over common roads.

Besides the above the Provisional Specification describes the following, which is disclaimed in the Final:

4. To adjust the height of the finger bar from the ground the frame "carrying the axis to which the finger bar is attached is supported upon the driving axis with a capability of moving thereon independently of the frame carrying the pole," which "is maintained at a uniform distance from the ground by means of a caster or roller fixed thereto or to the pole." The height of the finger bar is adjusted by a chain and quadrant, or a rack.

[Printed, 10/4. Drawing.]

A.D. 1866, June 22.—No 1666

GIRVAN, JOHN — (*Provisional protection not allowed*) —  
"Reaping machines."

1. A method of delivering the cut crop at the side is described. "This is accomplished by enlarging one end of the axle of the driving wheel, the axle being stationary and carrying the pinion shaft across the centre of the driving wheel, and through the enlarged part of the axle." A screw acting through mitre gearing works the rake, and there is a spring clutch interposed, so as to allow the rake to yield to obstructions. "The rake has teeth at both ends, and the teeth work through a suitable railed bottom" which is pivotted to the frame. "The side of the rake is made taper and a roller is placed at each end; next the teeth a circular

“ piece is placed on the railed bottom for the rollers to work on. An open space is left between the driving wheel and the railed bottom for the sheaf to drop in.” “A piece of iron is to be fastened to the frame of the driving wheel, and pins projecting out for the teeth of the rake to pass through, so that it may pull off any stalks of grain that the rake might lift.” “The side of the rake is a little bent, in order to place the roller a little behind the rake,” “and pins are placed in the edge of the railed bottom next the knife; when the machine revolves the roller will act on the railed bottom and raise it in front to the level, the pins holding the falling grain until the sheaf is properly divided, and when the sheaf is gathered and dropped into the recess the roller leaves the circular piece, and the railed table drops with its own weight on a spring.” The table can be adjusted by a shifting pin, or can be fixed. There may be a solid bottom under it. “On the other end of the rake axle rakes may be placed to rake the ground; these rakes being hinged a short distance from the head and provided with a spring capable of carrying the weight of the head.”

2. This part “consists in a peculiar arrangement of placing the horse close to the cutting part of the machine, so that there will be less of a twist on the horse.” “The shafts rest on the axle and are capable of moving on it, and are forced together by a circular piece outside the wheel, and that part of the shaft which rests on the inner end of the driving wheel is carried in the centre of the circular piece of cast metal in which the shafts are placed.”

[Printed, 4d. No Drawings.]

A.D. 1866, June 29.—No. 1738.

**HORNSBY, RICHARD.**—“Mowing and reaping machines.”

The axle of the bearing wheels works in a tube fixed to the frame carrying the pole and the driver's seat. Both the bearing wheels are used for driving, a ratchet being employed to allow of one or both running backwards. The gearing is carried in a frame pivotted to lugs on the tube above mentioned. An inclined shaft driven from the first motion shaft works a crank which actuates the cutter bar. The finger bar is carried by a frame pivotted to the bearing piece of the inclined shaft. “The fore end of the casting or frame to which the finger bar

" is fixed projects forward of such bar and is supported at its  
 " forward end by a small wheel, the position of the axis of  
 " which is capable of adjustment. The small wheel and for-  
 " ward part of the frame or casting of the finger bar is lifted  
 " off the land by a quadrant and chain acted on by a lever  
 " handle " " There is a small carrying wheel applied to the  
 " dividing shoe at the outer end of the finger bar, the position  
 " of the axis of which is capable of adjustment, and the point  
 " of bearing of the periphery of this wheel is as near as may  
 " be on a line with the points of the fingers." A notched quad-  
 " rant is fixed on the tube of the main shaft and the notches  
 " receive a pin on a lever the lower end of which is pin-jointed  
 " to the gear frame, which " is supported in either of two posi-  
 " tions, that is to say, whether the first-motion pinion of the  
 " cross shaft be in or out of gear with its wheel." " By having  
 " other notches in this quadrant, provision may be made for  
 " using different sizes of pinions to arrange the speed." " In  
 " constructing separate angular cutters or knives, in place  
 " of the places where they come together on the knife bar  
 " being straight butt joints, such points are formed natu-  
 " rally convex and concave, so that the convexity of one  
 " may enter the concavity of the other."

[Printed, 10d. Drawing.]

A.D. 1866, July 3.—No. 1764.

TYERMAN, HENRY.—(*Provisional protection only*).—"Reapers  
 " and mowing machines."

The invention refers to a method of checking the momentum  
 of the cutter bar at the end of each stroke, so as to avoid strain  
 and jar. The inventor says: "My improvement consists in  
 " the application of a slidable joint piece which I intend upon  
 " one or more slide bars or rods fixed to the framing parallel  
 " with the knife to which the knife is attached, and to this  
 " joint piece I attach the connecting rod. I also apply a  
 " spring or springs to this joint piece" and these reverse the  
 blow of the cutter bar at each stroke.

[Printed, 4d. No Drawing.]

A.D. 1866, July 24.—No. 1820.

CORBETT, THOMAS.—(*Provisional protection only*).—"Reaping  
 " machine."

1. The platform is formed of triangular bars (with a flat side upwards) fixed at a suitable angle to a cylindrical bar behind and parallel to the cutter bar. This bar turns "on its axis in bearings in the frame of the machine and the shoe, or it may be attached to the cutter bar."

2. A side delivery apparatus is used, which "consists of a curved plate or plates attached to the cylindrical bar in a direction diagonal to the cut of the machine." This guides the cut crop to the side either continuously, when the crop is to be laid in swathes, or at intervals when the platform is depressed to deliver the crop in sheaves.

[Printed, 4d. No Drawings.]

A.D. 1866, July 31.—No. 1974.

GEDGE, WILLIAM EDWARD.—(*A communication from Marie Naslot.*)—(*Provisional protection only.*)—"Spade or digging implement."

This "agricultural implement" "has the shape of a lengthened spade, it is divided into two parts, the one full or solid, the other hollowed out; the full or solid part which commences at the bottom of the socket may be more or less spread, and the hollowed out part presents the shape of a trident, the instrument therefore commences in a sort of fork and finishes by a spade." "The solid part may form one-third of the instrument and the teeth may be lance-shaped." "The centre of the spade forms a projecting rib, from which to the two side edges is a concave part." "The parts between the teeth form cutting edges and are steeled and tempered." "The projecting rib is continued to the extremity."

Two modifications are described. In the first, the teeth are half the length of the whole blade, and "are lengthened so as to present an equal thickness in nearly their entire length." In the second, the tool "presents in each hollowed or cut out part two cutting edges face to face."

[Printed, 4d. No Drawings.]

A.D. 1866, August 13.—No. 2076.

HALLIWELL, JOHN.—(*Provisional protection only.*)—"Implement for ploughing, digging, and cultivating land."

The following is the whole Provisional Specification :—

" This invention consists in the use of a 'float or digger  
 " attached to and underneath a strong frame of wood (or  
 " other material) by two upright pieces fixed one on each  
 " end of the float or digger, or the said float or digger may  
 " be made of such length that each end may be turned up-  
 " wards forming the uprights, by which, and pins and holes  
 " in the sides of the frame, it may be attached thereto. A  
 " number of 'coulters' are fixed to a cross rail in front of and  
 " parallel with the float or digger. A roller is placed across  
 " the frame between the coulters and the float or digger (or  
 " side wheels may be employed) so that by means of the  
 " roller or the wheels and holes in the end pieces of the float  
 " or digger and the pins the float or digger may be adjusted  
 " to any depth of cut desired. Near the back edge of the  
 " float or digger are a number of bars or pins attached  
 " thereto at an angle, or sloping backwards from the cutting  
 " edge or front of the float or digger, forming a grating  
 " through and between which the soil passes, and is delivered  
 " in finely divided particles in rear of the implement and  
 " stubble and mud on the surface of the soil. A seat above  
 " the roller or over the float or digger is provided for the  
 " person in charge of the implement so that the horse or  
 " team drawing the same may be driven."

[Printed, 4/ No Drawings.]

A.D. 1866, August 16.—No. 2103

SMITH, WILLIAM. Reaping machines.

The invention consists in applying an adjustable scraper to  
 the front of the bearing wheel. The scraper is carried by an  
 arm fixed to the draught pole of the frame, and is arranged  
 " w. . . edge set upwards and above the centre of the  
 " driving wheel."

[Printed, 8d. Drawing.]

A.D. 1866, August 22.—No. 2154.

HOWARD, FREDERICK —(*A communication from James Shark-  
 Iry Marsh.*)—(*Provisional protection only.*)—" Self-  
 reaper "

The rake arms are hinged to a crown wheel rotating on a vertical axis, and their ends run over a cam surface so that they are raised and lowered as required. One arm may have teeth and the others each "an adjustable slot or bar." The crown wheel is driven by a chain from the first-motion shaft.

[Printed, 4d. No Drawings.]

A.D. 1866, August 23.—No. 2165.

BAILLEUL, PIERRE VICTOR.—(*Provisional protection only.*)—

"Reaping machine."

The following is the whole Provisional Specification:—

"The invention consists in an improved construction of  
"reaping machine. This improved machine cuts the stems  
"of the corn and hay, and is put in motion by hand or other-  
"wise. To construct the improved machine I place in a  
"carriage a vertical shaft made to oscillate on its axis, and  
"furnished with an inclined scythe handle passing over the  
"carriage, so as to shave the ground at its extremity which  
"is furnished with one or several scythe blades. The vertical  
"shaft receives an alternate circular movement by the hand  
"or by means of wheels while the carriage is moved forward,  
"and the corn or hay are reaped or mowed as by the  
"ordinary method."

[Printed, 4d. No Drawings.]

A.D. 1866, August 24.—No. 2182.

BOUSFIELD, EDWARD TENNEY.—(*Provisional protection only.*)

—"Reaping and mowing machines."

In order to get the crank shaft which drives the cutters low enough to act most efficiently on the cutters, "the shaft which  
"carries the bevel pinion that gears with the ring of bevel  
"teeth on the driving wheel of the machine is fitted at its  
"inner end with a spur wheel which drives a pinion on the  
"crank shaft. This shaft is mounted horizontally, and parallel  
"with the shaft that takes the motion from the driving wheel.  
"The two shafts are mounted in the same casting, the crank  
"shaft being below the other, but in the same vertical plane."  
The knives are half the usual breadth, and the cutter bar has the same traverse as usual. The reel shaft is set "at an angle  
"to the cutter bar," and there is one rake on it, or the reel



may be set with its axis parallel to the cutter bar, and then the arm carrying the rake is hollow, and "forms a socket for a rod which carries the raker." Levers on this rod strike against fixed cams which "give the desired axial motion to the rod which carries the raker, and will thus move round the rake bar and cause it to sweep off the cut corn." A coiled spring may also be used for this purpose. Elastic "tines made of cane or stiff fibrous material" may be used instead of the ordinary rake teeth.

[Printed, *ed.* No Drawings.]

A.D. 1866, September 1.—No. 2254.

BAKER, JOHN —Reaping machines.

The teeth of the rake instead of being firmly secured in the head, are set in separate pieces, each piece carrying two or more teeth, and these pieces are hinged to the rake head and kept up to their work by springs. Or each tooth may be thus mounted with a separate hinge and spring.

[Printed, *ed.* Drawing.]

A.D. 1866, September 3.—No. 2268.

CAMBRIDGE, WILLIAM COLBORNE.—(*Provisional protection only.*)—"Clod crushers and press wheel rollers."

The following is the whole Provisional Specification:—

"My invention relates to the shape, form, and construction of wheels for clod crushers and press wheel rollers. I construct the wheels say about twenty-two inches in diameter with a periphery about three inches wide, half an inch thick in the middle, and tapered off to a quarter of an inch on each side. On the rim are to be placed projecting points about an inch and a quarter deep, three inches from point to point, the tops of which are to be about five-eighths of an inch long, three-eighths wide, tapered off from each angle, the front and back of each point to be made with a thin cutting edge. Between each point are to be placed across the rim of the wheel other projections about an inch and a quarter deep at the centre, and three-quarters at each outside, one-sixteenth thick at the top, in the middle tapered off at each outside to a thin cutting edge with a corresponding width where fixed to the rim of the wheel. Clod

crushers or rollers constructed of a number of wheels of this kind will penetrate and break the hardest blocks and will reduce them to a fine pulverised state, and will also press any kind of soil fine to the roots of plants. Every other wheel of the series should be made one inch larger in diameter, and one inch larger in the hole than the adjoining ones, and will produce a self-clearing action. Wheels for road crushers and press wheel rollers on this principle can be made larger or smaller as required."

[Printed, 4d. No Drawings.]

A.D. 1866, September 8.—No. 2314.

URGESS, CHARLES THOMAS.—Reaping machines.

The improvements relate to the delivery apparatus.

1. A reel is made with two arms fixed in the usual way, and other two fitted so as to be capable of swinging backwards and forwards in the line of the axis of the reel. This movement is given them by a roller on each arm running on a fixed surface on the reel standard.

2. The rake is so mounted that it remains in a vertical or nearly vertical position while it is travelling across the platform. This is effected "by attaching the board to the arms" by pins projecting outwards from "the arms at an angle in such manner that as the arms are moved inwards" "the outer ends of the pins are lowered. The inward motion of the arms by tending to incline the pins downwards counteracts the tendency to incline the pins upwards arising from the rotary motion of the arms," "and thus the rake is kept nearly in a vertical position while passing the platform."

3. Some or all of the beaters of the reel are made removable. "For this purpose the arms that carry the beaters are arranged to be capable of sliding endwise to and fro in guides on a plate capable of turning around the axis, and to each arm a toothed rack is attached which gears with a pinion fast on the axis, by this means if the arms be rotated in one or other direction around the axis they will simultaneously be moved inwards or outwards, and can be set at any required distance from the axis."

[Printed, 4d. Drawings.]

A.D. 1866, September 14.—No. 2358.

RICHES, RICHARD ROBERT, and WATTS, CHARLES JAMES.—  
(Partly a communication from Daniel G. Adelsberger.)—"Horse  
" hay rakes."

The invention consists in making the rake self-acting when required. "A toothed wheel on the main wheel shaft or axle  
" is arranged to gear with a similar wheel on a shaft on  
" which is mounted a crank wheel connected by a slotted  
" connecting rod with a lever, which is connected to the  
" shaft or axle for working the teeth of the rake, and has a  
" joint at or near a slotted guide bar through which the teeth  
" of the rake pass. By this arrangement when the crank  
" wheel has been put into gear by the attendant, that wheel  
" will be caused to revolve as the rake is drawn over the  
" ground and the teeth of the rake will be worked up and  
" down, thus discharging the hay therefrom without any  
" action on the part of the attendant. When it is desired to  
" use the rake as an ordinary one, a stop lever is moved into  
" a notch formed in the crank wheel and a coupling on the  
" crank wheel shaft disengaged, whereby the rotation of the  
" crank is stopped and with it the working of the teeth of  
" the rake, which can then be used in the ordinary way. A  
" pedal is arranged so as to be capable of depressing the teeth  
" of the rake by means of jointed connecting rods and levers  
" which are caused to act on the shaft to which the said teeth  
" are fixed, and a second pedal is employed to raise them by  
" the same means. The teeth of the rake are or may be  
" formed of steel or iron."

[Printed, 10d. Drawing.]

A.D. 1866, September 22 —No. 2439

FUSSELL, JAMES GEORGE CURRY, and WISE, WILLIAM, the  
younger.—Scythes.

The improvements consist in a method of connecting the  
scythe blade and handle so that the former can be adjusted as  
required. For this purpose the tang of the blade is fitted in a  
socket pivotted to the handle. The tang is round and turns  
freely in the socket in which it is fixed by a tightening screw  
in any position required. The socket is pivotted between ears  
on a strap on the handle, and a lug on the strap is held  
between screws on the head of the socket so that the angle

can be adjusted at which the socket, and consequently the blade, is set with the handle.

[Printed, &c. Drawing.]

A.D. 1866, September 29.—No. 2523.

HORNSBY, RICHARD, and PHILLIPS, JAMES EDWIN. —  
"Reaping and mowing machines."

1. The rake is driven as follows:—"Fixed to the frame of the machine is a bar, and on the lower part of this bar, which is upright, a tubular axis turns freely; this tubular axis is driven in any convenient manner, and receives on its exterior a ring to which the rake arms are jointed so that they can rock in a vertical plane. As the tubular axis rotates it carries round the ring upon it with the rake arms jointed thereto, and as these revolve they are governed or caused to rock on the joints which connect them to the ring by linking them to a collar upon the upper end of the fixed bar on which the tubular axis turns. The upper end of the bar is bent towards the platform, so that the collar is not vertically over the tubular axis which carries the rake arms round; thus the rakes as they come round are depressed so as first to dip into the standing crop, and then their teeth pass close to the surface of the platform, and sweep the cut crop therefrom; as the rakes return on the other side of the axis they are raised." The rake arms are tubular, and the opposite arms are connected by "two clip pieces, which at their ends are made to embrace the tubular rake arms, and at the centre receive the pivots on which the rakes rock."

2 The "axis of the rake arms" is "at a distance in front of the points of the fingers several times greater than this distance has ever heretofore been" so that "at the moment the rake comes into the cut crop on the platform it is moving rapidly to the side at which the crop is to be discharged."

3 To assist the delivery at the side, a "rail or bent prong" is fixed "around the outer side and back of the platform at a height of some inches above its guard rim." This rail is fixed "at its forward end to the rim of the platform at a point underneath the ordinary prong of the divider." The other end "is free or unattached."

4. Grooves corresponding with the rake teeth are formed in the platform.

5. The rake arms may be fixed on their vertical shaft, which is then mounted outside the bearing wheel, longer arms being used.

6. For delivering the cut crop in sheaves a tilting platform is used, the bars of which incline "away from the standing crop" "so that the platform in discharging may by the incline of the bars tend to carry the crop sideways." In combination with this platform is used "an inclined board or track clearer jointed to the outer end of the finger bar, this track clearer catches the cut crop when it is discharged from the tipping platform, and in consequence of its inclined position it guides it away to one side." Some of the bars of the tilting platform are "lengthened by means of pieces jointed to their ends, which serve to prevent the cut crop working underneath the track clearer." The track clearer is supported by a pivot wheel, and is formed with a ledge to support the heads of the cut crop when the crop is long. The heads being drawn from this ledge by a hand rake, they fall "under a flange projecting forwards from the upper edge of the track clearer at its rear end, which keeps the heads down and compresses the sheaf."

7. The crank is thus arranged:—"At the end of the crank shaft is a disc, and a circular recess is formed in it, in the centre of this hollow is fixed the crank piece, which has a spherical head, and is embraced by a cup on the connecting rod, the rim of this cup enters the recess in the disc, and the crank pin is thus protected."

8. To regulate the height of the cutters a wheel is used, which is adjusted "by making the end of the arm which carries it as a disc with radial teeth on its face and this fits against a corresponding disc on a projection from the finger bar." These two discs are held in any required position by a screw. This improvement may be applied to the machine described in No. 1738, A.D. 1866.

9. In machines in which the finger bar is jointed to "a tubular frame containing the crank axis which drives the knife," the finger bar, &c. is raised by a chain "connected at one end with a ring encircling the tubular frame" and at the others to a quadrant worked by a lever. There is an

arm on the joint of the finger bar, which “projects under the pole, so that when the inner end of the finger bar has been raised a short distance by the quadrant and chain, this projecting arm comes against the pole, and the rising of the inner end of the finger bar being thus resisted its outer end is lifted.”

10. The inventors “apply the draught by means of a chain or rod passing along underneath the pole, and connected with the machine” not “vertically under the pole, but at a distance sideways,” the chain, &c. being attached to one of several holes in the framing.

[Printed, &c. 2d. Drawings.]

A.D. 1866, October 3.—No. 2543.

LANE, EDWARD PYKE.—(*Provisional protection only.*)—“Reaping machines.”

“The invention consists in placing a flap or ledge immediately over the knives, and slightly raised above them. This flap or ledge extends the whole width of the machine, and projects partly over the knives, and partly over the front edge of the delivery board or platform, part of which latter is removed so as to leave a space between it and the back of the finger bar. The backward edge of the flap or ledge fits in a groove in the delivery board or platform, and its two ends are provided with pivots working in holes or slots in the side framings or cheeks of the machine, so that it can be raised or lowered so as to suit its position to the nature of the crop to be cut. The grain as it is cut by the knives falls direct upon this flap or ledge instead of upon the knives, and is thereby conveyed to the delivery board or platform, being entirely prevented from falling upon and choking the knives whilst soil or other refuse matter with which the knives may come in contact will pass over the latter and through the space above mentioned.”

[Printed, &c. No Drawings.]

A.D. 1866, October 18.—No. 2689.

MANWARING, WILLIAM — “Reaping and mowing machines.”

The object of the invention is “to obtain such a delivery of the sheaf in reaping and mowing machines as will form a



" track for the next passage of the machine." The machine is furnished with a reel which carries three vanes and a rake. The vanes are fixed, but the rake has a swinging motion in the plane of the axis. By a fixed cam surface on one of the reel standards, the rake is swung over towards the driving wheel just as it reaches the platform. This throws the cut crop on a tilting platform which delivers it "on the ground" sufficiently far from the standing crop to give a clear path "for the passage of the machine on the next round."

[Printed, &c. Drawing.]

A.D. 1866, October 22.—No. 2727.

PEDDAR, SPENCER.—"Machinery for lifting or pitching cut crops."

The object of this invention is to supersede the employment of hand labour in loading waggons with agricultural produce. For this purpose it "is raised by means of forks carried by "endless chains," supported by two rollers or barrels, one "mounted in bearings in the frame of the waggon near the "ground, and the other on the upper part of a frame which "is capable of being raised and lowered," and "retained in "any desired position." This is accomplished by racks and pinions. The apparatus "travels along with the waggon, a "curved 'gathering fork' at the rear of the latter collecting "the material to be raised, and the forks on the endless "chains, to which motion is communicated" from one of the axles of the waggon "raising such material into a trough "connected to the upper part of the frame, from which it is "discharged into the waggon by a spiked wheel" or other suitable apparatus. "When the lifting apparatus is required "to be out of operation during the movement of the waggon "the gathering fork may be turned upwards." The apparatus may also be separate and mounted on wheels of its own from which the required motion is derived.

[Printed, &c. Drawing.]

A.D. 1866, October 25.—No. 2754.

MILLS, BENJAMIN JOSEPH BARNARD.—(*A communication from the Collins Company.*)—"Manufacture of ploughs."

1. The first part consists in "the manufacture of those parts "of a plough commonly made of steel, and known as the

" 'land side' the 'mould board' and the 'standard' or frame,  
" of cast 'cast steel' and of irregular form and of variable  
" thickness as desired, according to the amount of wear to  
" which the various parts are liable." The share, mould  
board and standard, and land-side are separate castings con-  
nected by suitable flanges and rivets.

2. The second part "consists in the opening or loosening up  
of the mould as soon as the steel is poured and before the  
metal chills enough to shrink to any considerable extent,  
thereby relieving the casting and preventing its cracking."

[Printed, 8d. Drawing.]

A.D. 1866, November 1.—No. 2834.

DENTON, HENRY RICHARD JOHN.—"Machinery for bending  
" chain links "

The links are such as are used for chain harrows, &c. The  
apparatus may also be used for bending rake teeth. A vertical  
standard has on it a mandril, the bottom part of which is  
formed with a flange having attached to it a "jointed com-  
" pressing chain," held tight by a weight. Lengths of bar  
iron are placed between the mandril and the chain and are  
thereby formed into the shape required. A clutch is arranged  
to be operated by a hand lever, or by a slack chain which is  
wound up by the shaft so that the clutch is moved automati-  
cally.

[Printed, 8d. Drawing.]

A.D. 1866, November 7.—No. 2903.

NEWTON, ALFRED VINCENT.—(*A communication from Jacob  
William Schunkers.*)—Reaping machines.

" The carrying wheels are placed loosely on their axle, and  
" fitted to one wheel within the framing is a concentric  
" toothed rim; over the axle is bent a bar or extended saddle  
" which is secured firmly thereto, so that the two may rock  
" together. The rear part of the bar or saddle extends back  
" of the axle in an inclined position, and to its extremity the  
" finger bar is secured at right angles to the saddle bar. The  
" front part of the saddle forms a forked-radius bar, and  
" serves to carry a cam which is composed of a drum, the  
" periphery of which is fitted with a double set or series of

" oblique wings or flanges, one set or series having a reverse  
 " position to the other. A space is left between the two sets  
 " sufficiently wide to admit of a friction roller passing between  
 " them. On the cam shaft a pinion is keyed which gears with  
 " the toothed rim of the inner carrying wheel, and communicates  
 " motion from that wheel to the cam as the machine is  
 " drawn along. The friction roller is mounted at one extremity  
 " of a rock lever, which lever has for its fulcrum a pin  
 " projecting down from the saddle bar; the rear end of this  
 " rock lever is connected by a link to the sickle bar. The  
 " rotation of the cam imparts a reciprocating motion to the  
 " sickle bar and the friction roller of the rock lever will  
 " always remain in gear with the cam or will not become  
 " casually disconnected therefrom while the machine is at  
 " work or is being drawn along, but in backing the machine  
 " the roller will at once be thrown out of gear with the cam  
 " either to the right or the left of the same, according to  
 " which wing or flange of the two sets or series acts at the  
 " moment against the roller."

[Printed, Ed. Drawings.]

A.D. 1866, November 19.—No. 3031.

WARDLAW, THOMAS.—"Reaping machines."

The invention relates to "self-acting side-delivery rakes  
 and" consists of an upright fixed standard secured to the main  
 " framing at the inner end of the cutting edge of the platform,  
 " such standard supporting a vertical rocking shaft which  
 " works in a footstep at the lower end, and in a bearing near the  
 " upper end of the standard. A rocking or partial rotatory  
 " motion to and fro is imparted to the vertical shaft by means  
 " of a horizontal arm secured to the lower end thereof, and  
 " jointed to the end of a connecting rod working from a crank  
 " shaft. The upper end of the vertical rocking shaft carries  
 " a horizontal cross shaft, to the longer overhanging portion  
 " of which the arm or arms of the rake is or are attached,  
 " whilst to the opposite end of such cross shaft, which also  
 " projects or overhangs slightly beyond the vertical rocking  
 " shaft, there is fitted a pinion which bears against the outer  
 " side of and gears with a horizontal toothed quadrant fixed  
 " by suitable brackets to the top of the upright standard;

" this pinion is connected to the cross shaft through the  
 " intervention of a ratchet wheel and detent, which will allow  
 " it to revolve loosely on the shaft when travelling along the  
 " quadrant in one direction, but will couple it with the same  
 " shaft when travelling in the opposite direction." The rake  
 " may be balanced by a weight, or a second rake may be applied  
 " so as to balance the first. " On imparting, say, a quarter of  
 " a revolution to the vertical rocking shaft (supposing the  
 " rake to be at the cutting edge of the platform) the cross  
 " shaft with the rake attached will be caused to sweep round  
 " horizontally over a quarter of a circle, thereby causing the  
 " rake with the cut corn to travel along the platform from  
 " the cutting edge thereof to the delivery edge at right angles  
 " thereto; whilst it is making this sweep the pinion turns  
 " loosely on the cross shaft, which latter consequently does  
 " not revolve on its axis, but on the return of the crank the  
 " cross shaft will move back again, so as to return to its  
 " former position over the cutting edge of the platform, and  
 " will whilst so returning revolve on its axis, as the pinion  
 " by the action of the ratchet and detent will then be coupled  
 " with the shaft. The rake will consequently turn over or  
 " make one revolution so as to be clear of the platform during  
 " the return sweep of the cross shaft, and be brought parallel  
 " to the knives in readiness for the next sheaf." " The rake  
 " is kept stationary by a stop or keeper at the top of the ver-  
 " tical rocking shaft until its next movement is required. If  
 " preferred the quadrant rack may be fastened to the foot of  
 " the upright standard, in which case the motion of the  
 " pinion may be transmitted by a pitch chain to the rake  
 " shaft. In some cases an upright spring may be fixed on  
 " the standard, and a short lever arm carried by the top of  
 " the rake, such lever arm coming in contact with the spring,  
 " and preventing the rake from revolving too far before it  
 " takes its horizontal sweep."

[Printed, &c. Drawing.]

A.D. 1866, November 19.—No. 3036.

GIBBS, WILLIAM ALFRED.—"Drying and elevating hay."

The hay, &c. is dried by a hot blast. A suitable receiver is  
 connected with a tube leading from a fan. This receiver may  
 be constructed so as to form a cart which can be transported

These chains are mounted so as to be driven by suitable chain wheels, and during the lower part of their traverse they pass over a bar which is fixed so as to extend along below the chain and between the prongs carried by the pairs of links. The bar therefore serves to clear the chain.

Two machines are described for constructing such chains. In the first straight bars of iron are bent at the ends into the required shape, and in the second these bent ends are further doubled over the pins and secured thereon.

[Printed, 1s. 10d. Drawings.]

A.D. 1866, November 30.—No. 3150.

PILCHER, WILLIAM WOOD.—“Construction of horse-hoe.”

“The arms which carry the tines are mounted on pins fixed in bearings attached to a horizontal bar immediately behind the axle-tree; these arms are curved in the form of a swan’s neck, so as to bring the lower part (which carries the tines) into nearly a horizontal position, which will give increased strength and rigidity, and will keep the tines more firmly to their work. All the tine arms are connected to the same horizontal bar, and therefore by lifting up one or more arms all will be simultaneously lifted up. The raising or lowering of the tines for the purpose of regulating or modifying their operation on the land is effected by means of a hand lever behind; this lever is forked and its fulcrum of motion is the same as that of the tine arms, but it is capable of an independent motion; from the forked arms of this regulating lever depend two links provided at their lower ends with eyes, which embrace two of the tine arms, so that by raising the lever these links will act on the tine arms, and thus lift the tines out of and from the ground. When using this implement the attendant walks behind with his hand on the regulating lever, by raising or depressing which he can either lift the tines out of the ground or cause them to enter farther in. As the arms pass freely through the eyes of the links they are capable of a limited independent motion in a vertical direction without reference to the regulating lever.”

[Printed, 10d. Drawing.]

A.D. 1866, December 3.—No. 3175.

**VOLKMANN, FREDERICK.**—"Ploughs."

"This invention consists in a new and improved plough of such a construction that the adjustability of the same may be effected without the aid of plough handles or any equivalent therefor, and that the ploughshare when thrown out of the furrow by any impediment will resume its original position in the furrow without any effort on the part of the attendant. Supported by the land and furrow wheels is a vertical rectangular frame, to the lower part of which a segment-shaped draught bar is attached, the bar being furnished with holes to receive the regulating pin or screw which adjusts and maintains the position of the draught rod. Secured to the lower bar are also two bars furnished with holes to receive the lower end of a vertical screwed shaft, the upper bearing of which is carried by the top bar of the vertical frame; this bearing is fitted to the bar in such manner that it is free to slide thereon, and may be secured in any required position by a clamping screw. A crank handle is keyed to the top of the screw shaft for giving it an axial motion. Fitted to the screwed shaft is a tapped nut, from the side of which is suspended a balance lever; the ends of this lever are hooked to receive each a link connected to the head of the plough beam, and it is by these links that the head of the beam is suspended; by turning therefore the screw shaft the head of the beam may be raised or lowered at pleasure to adjust the dip of the ploughshare. To secure the beam laterally it is coupled to the screw shaft by means of a chain and set screw. The lateral adjustment of the wheels with regard to the beam will be effected by shifting the screw shaft to the right or left (as required) in the vertical frame, and the 'land' wheel will be adjusted as usual to suit different depths of ploughing."

[Printed, 10d. Drawing.]

A.D. 1866, December 4.—No. 3186.

**HASELTINE, GEORGE.**—(*A communication from John Gould Perry.*)—"Mowing and reaping machines."

1. The frame is supported on two wheels, of which the one near the cutter bar "has a large open centre," and revolves



on a "rim or flange" fixed to the frame. The connecting rod driving the cutters passes through this open wheel. The finger bar is attached to the "drag bar" the front end of which plays in a vertically slotted piece, its place being limited by a moveable pin placed across the slot. An arrangement of levers and chains is mounted so that the finger bar, &c., can be raised, or by holding down the back of the "drag bar," the front of it and of the cutters may be raised.

2. The bearing wheel next the cutters has a hollow axle, through which the connecting rod passes. This rod is operated by a rock shaft vibrated by a cam wheel on the other bearing wheel. The cutter bar, &c. can be raised by a lever.

3. Both the bearing wheels are used as drivers. The connecting rod passes through the hollow axle of the one and drives the cutters. The finger bar is fastened to the "drag bar" the front end of which is raised by a screw and the lower end by a chain worked by a lever and quadrants. The connecting rod is jointed to allow the cutters, &c. to be raised.

4. The palls through which the motion is transmitted from the axle of the bearing wheels are made "self-acting." "Pressure or friction plates," loose on the axle, are forced by springs against the ratchet wheels. Pins on the plates fill slots in these plates, and when the machine is running forward these force the palls into the ratchet teeth. When it is reversed, they lift out the palls. The "drag bar" is connected at its forward end by a swivel joint to a "standard" sliding "through the front part of the frame." The back end of the said drag bar is secured on its "inner" side by a hinged brace "which extends to the opposite" side of the frame "behind the axle. This position enables the rod to "slip over and rise above any obstructions." The cutter is operated by a rocking lever and cam wheel.

5. An arrangement for enabling a pair of shafts to be converted into a pole. The shafts are connected each to a curved piece hinged to the frame on the opposite side to the shaft, and are secured by pins. On removing these pins, the shafts are free to swing over, and may be brought together in the centre and used as a pole. They are then connected together by a chain. This arrangement can be applied to any sort of carriage.

[Printed, 1s. 6d. Drawings.]

DIVISION 1.—FIELD IMPLEMENTS.

A.D. 1866. December 6.—No. 3220.

TURNER, FREDERICK WILLIAM.—"Reaping and mowing machines."

1. The rakes are so mounted on the radial arms which carry them that while the arms "turn in one direction the rakes "turn in an opposite direction" "and always maintain the "same angle with the line of motion of the machine or with "that of the cutter bar, whatever may be the position of the "radial arms." "This is effected by means of bevil wheels "attached to spindles revolving in the radial arms and "working round an idle or fixed wheel attached to the bearing of the vertical shaft."

2. Motion is communicated to the cutter by an "oblique "disc," instead of a crank. The disc also may be set on an oblique shaft, instead of being itself oblique. "The disc "is fitted with an encircling cap having two pivots which "work in the forked end of a shaft to which they impart a "rocking motion as the oblique disc or spindle revolves; "such oscillating or rocking shaft is fitted at the opposite "end with a lever arm of suitable length to give the required "stroke" "By the use of these means the knife bar can "be placed in any required position." The knife bar also may have "double the usual length of stroke," viz., "a stroke "equal to the distance of two fingers." Thus the speed of the shaft need only be half the usual speed.

3. In machines "reaping with back delivery where it is "preferred to bind the corn as fast as it is cut," there are "three "vanes or radial arms revolving with a spindle placed across "the front of the machine to gather in the standing crop to "the cutter bar, somewhat as usual, but with a fourth vane "carrying a rake mounted on the end of lever arms (one "at either side of the machine) and attached to the radial "arms revolving on the same spindle; the opposite ends of "such lever arms are connected by rods to the lever arms "near the spindle, one of which arms is provided with an "anti-friction roller working in a fixed cam of such form as "to guide the fourth vane or rake horizontally over and in "close proximity to the table of corn once for every revolution of the vanes."

[Printed, 1s. 8d. Drawings.]

A.D. 1866, December 6.—No. 3223.

FREER, JOHN.—(*Provisional protection only.*)—"Machines for dibbling or planting grain and seed, and an improved seed feeder and meter for planting machines."

"The machine consists of one or more wheels attached to a suitable framework." There are holes in the periphery of each wheel opened and closed by "lever valves" operated by means of an eccentric groove in which friction pulleys on the ends of the levers work. The seed is delivered along partitions in the interior of the wheel. "The metre consists of cups with round storks, which instead of being made fast to the rounds, as in the ordinary way, are free to rotate about half a revolution." There are "two on one stork, at each end of the stork, so as to feed right and left." A short lever or "pendant" is attached to each stork. As the cups rise from the seed trough the pendants by their own gravity fall from the periphery of cylinder towards the centre and by that means keep the seed cups, already filled with seed on a lever until they arrive at the place of deposit, when the pendants come in contact with an eccentric which turns them out towards the periphery of cylinder at the same time turning the cups nearly upside down, and emptying the seed."

[Printed, *id.* No Drawings.]

A.D. 1866, December 8.—No. 3236.

ROBERTSON, WILLIAM, and WADDELL, CHARLES JAMES—

"Machines driven by human, animal or other power having a reciprocating motion."

Among the machines to which the invention is applicable, a reaping machine is figured and described.

"On the wheel, moved by hand or foot, horse or other power is fastened a wheel, external or internal, into which is geared another internal or external wheel in oscillating contact so proportioned as to produce the required number of oscillations for one of the wheels before mentioned." "The wheels may be held in gear by central pins or pins more or less oval or not placed in the centre."

In the figure an external spur wheel is shown as mounted within the driving wheel, which has internal spur teeth. The

wheels are in gear at the lower side, and the inner wheel is not revolved but apparently receives a jogging motion which is communicated to the cutters by an arrangement of levers.

[Printed, 1s. Drawings.]

A.D. 1866, December 17.—No. 3318.

HOWELL, EDWARD, and HARDY, THOMAS.—(*Provisional protection only*)—"Construction of horse rakes."

"The arrangement for raising the teeth of the rake by manual power" "is as follows.—A lifting bar is placed transversely beneath the teeth, and is raised by the action of a spiral spring which is extended or compressed by means of a hand lever, which latter acts upon a series of jointed levers connected with the spring and with the transverse lifting bar." The action of the spring is also assisted by that of a pinion revolved from the bearing wheels which engages with a rack brought into contact therewith by the depression of the lever.

To enable the teeth to be raised at certain intervals, a spiral groove is formed in a plate on the shaft of the pinion above referred to. A moveable stop in this groove acts on a lever which releases the spring and this raises the teeth.

[Printed, 8d. Drawings.]

A.D. 1866, December 20.—No. 3361.

LAKE, WILLIAM ROBERT.—(*A communication from William Hudg. Burridge.*)—"Machine for digging potatoes also applicable to digging for other purposes."

A broad wheel with deep flanges is mounted in a suitable frame with steering handles behind, and a place for attaching a team in front. The flanges are fitted with serrated cutters, and there are fixed coulters carried by the frame. An endless band carrying forks or buckets passes over the wheel and over a pulley above. Behind the wheel is a curved rake or grid, and above it is a table. The potatoes are dug up by the forks and carried against the rake, through which the dirt, &c. falls. The potatoes are carried on and delivered on the table above. The machine may be used for trenching, in which case buckets are fitted on the endless band, and a scraper substituted for the rake. This scraper may be formed so as to cut a channel at the bottom of the trench, in which drain pipes may be laid.

Guides are fitted on the frame which rest on the ground, and thereby regulate the depth of the trench.

[Printed, 8d. Drawing.]

A.D. 1866, December 21.—No. 3368.

HOWARD, JAMES.—(*A communication from James Sharkey Marsh*)—"Mowing and reaping machines."

The machine has two bearing wheels, between which is a table or platform to which the gear-work is attached. The finger bar, &c. is fixed to a "drag bar" the ends of which are connected to levers, one of which passes in front of the inner driving wheel, and the other behind it. A system of levers is arranged for raising and lowering the drag bar levers, &c. to adjust the height of the cutters. When required, the drag bar and cutters can be turned up for purposes of transport. The grain platform is carried by adjustable castor wheels. The raking apparatus is carried by the platform, and is free to rise and fall therewith. To give sufficient strength there is an "arched casting" which "spans the finger bar, and through it the sickle bar works, one leg of the casting being secured to the drag bar, and the other to the grain platform." A crown wheel pivotted on the top of this casting carries the rakes, and gives them the necessary rotary motion. The rake arms are raised and lowered by working over cam surfaces on the casting. "The rake bars carrying the teeth which remove the cut corn from the platform are hinged to the carrying arms, and they are held in position by a spring catch. This arrangement allows of the teeth of any one of these bars being turned out of the way when required, and the toothed bar will thus become a simple gatherer." The rake arms are connected by tie rods so that they balance one another.

[Printed, 1s. 2d. Drawings.]

A.D. 1866, December 28.—No. 3403.

ABEL, CHARLES DENTON.—(*A communication from John Francis Bennett*).—(*Provisional protection only*)—"Prevention of 'rot' in potatoes and grapes, and the similar blight in trees, fruits, vegetables, insects and animals."

The Specification states a theory of the inventor that blight is caused by "minute discharges of electricity," and he pro-

poses to prevent injury to the plants by setting up lightning conductors near the plants. The conductors are in height "by preference about one and a half times that of the plant," and their distance apart equal to their height.

[Printed, 4d. No Drawings.]

A.D. 1866, December 31.—No. 3436.

**EXALL, WILLIAM.**—"Machinery for cutting grass, corn, and similar agricultural produce, and for gathering and binding the same into sheaves."

The cutting apparatus may be of the ordinary character, but the inventor prefers to use "a thin sharp-edged steel band saw or other belt furnished with proper cutters working rapidly over riggers or rollers erected on a proper travelling frame." A stone or other sharpener may be fitted so as to be brought down on the cutters to sharpen them. "As the cut corn falls against the machine, it is seized by a system of travelling fingers or projections and by them working through the proper guides it is gently carried through a suitable conductor towards the side or rear of the machine; and when there is sufficient to form a sheaf a pair of circular arms carrying suitable tyers or bands are made to embrace, compress and properly fasten the sheaf, and by means of cam or other suitable mechanism deliver it on the ground." One mode of tying or fastening is with a string with a loop formed at each end, one of which loops is carried through the other by the closing of the arms, and is caught by a hook which draws it through the loop and effectually fastens the sheaf." The horses may be placed in front or behind, or the machine may be worked by hand power.

[Printed, 1s. Drawings.]



Guides are fitted on the frame which rest on the ground, and thereby regulate the depth of the trench.

[Printed, 8d. Drawing.]

A.D. 1866, December 21.—No. 3368.

HOWARD, JAMES. (*A communication from James Howard Marsh.*)—"Mowing and reaping machines."

The machine has two bearing wheels, between which is a table or platform to which the gear-work is attached. The finger bar, &c. is fixed to a "drag bar" the ends of which are connected to levers, one of which passes in front of the main driving wheel, and the other behind it. A system of levers is arranged for raising and lowering the drag bar levers, in order to adjust the height of the cutters. When required, the drag bar and cutters can be turned up for purposes of transport. The grain platform is carried by adjustable castor wheels. The raking apparatus is carried by the platform, and is free to rise and fall therewith. To give sufficient strength there is an "arched casting" which "spans the finger bar, and through it the sickle bar works, one leg of the casting being secured to the drag bar, and the other to the grain platform. A crown wheel pivoted on the top of this casting carries the rakes, and gives them the necessary rotary motion. The rake arms are raised and lowered by working over cam surfaces of the casting. "The rake bars carrying the teeth which remove the cut corn from the platform are hinged to the carrying arms, and they are held in position by a spring catch. This arrangement allows of the teeth of any one of these bars being turned out of the way when required, and the toothed bar will thus become a simple gatherer." The rake arms are connected by the rods so that they balance one another.

[Printed, 1s. 2d. Drawings.]

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to prevent injury to the plants by setting up lightning rods near the plants. The conductors are in height preference about one and a half times that of the plant," their distance apart equal to their height.

[Printed, &c. No Drawings.]

A.D. 1866, December 31.—No. 3436.

LL, WILLIAM.—"Machinery for cutting grass, corn, and other agricultural produce, and for gathering and binding same into sheaves."

The cutting apparatus may be of the ordinary character, but the inventor prefers to use "a thin sharp-edged steel band saw either belt furnished with proper cutters working rapidly over riggers or rollers erected on a proper travelling frame." One or other sharpener may be fitted so as to be brought on the cutters to sharpen them. "As the cut corn falls into the machine, it is seized by a system of travelling rollers or projections and by them working through the proper guides it is gently carried through a suitable conveyor towards the side or rear of the machine; and when the corn is sufficient to form a sheaf a pair of circular arms revolving suitably tyers or bands are made to embrace, compress and properly fasten the sheaf, and by means of one or other suitable mechanism deliver it on the ground." The mode of tying or fastening is with a string with a loop fixed at each end, one of which loops is carried through the other by the closing of the arms, and is caught by a hook which draws it through the loop and effectually fastens the sheaf." The horses may be placed in front or behind, the machine may be worked by hand power.

[Printed, &c. Drawings.]

## AGRICULTURE.

Guides are fitted on the frame which rest on the ground, and thereby regulate the depth of the trench.

[Printed, 8d. Drawing.]

A.D. 1866, December 21.—No. 3368.

HOWARD, JAMES.—(*A communication from James Sharkey Marsh*)—"Mowing and reaping machines."

The machine has two bearing wheels, between which is a table or platform to which the gear-work is attached. The finger bar, &c. is fixed to a "drag bar" the ends of which are connected to levers, one of which passes in front of the main driving wheel, and the other behind it. A system of levers is arranged for raising and lowering the drag bar levers, so as to adjust the height of the cutters. When required, the drag bar and cutters can be turned up for purposes of transport. The grain platform is carried by adjustable castor wheels. The raking apparatus is carried by the platform, and is free to rise and fall therewith. To give sufficient strength there is an "arched casting" which "spans the finger bar, and through it the sickle bar works, one leg of the casting being secured " to the drag bar, and the other to the grain platform." A crown wheel pivotted on the top of this casting carries the rakes, and gives them the necessary rotary motion. The rake arms are raised and lowered by working over cam surfaces on the casting. "The rake bars carrying the teeth which remove " the cut corn from the platform are hinged to the carrying " arms, and they are held in position by a spring catch. This " arrangement allows of the teeth of any one of these bars " being turned out of the way when required, and the toothed " bar will thus become a simple gatherer." The rake arms are connected by tie rods so that they balance one another.

[Printed, 1s. 2d. Drawings.]

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ABEL, CHARLES DENTON.—(*A communication from John Francis Bennett*).—(*Provisional protection only*).—"Prevention of 'rot' " in potatoes and grapes, and the similar blight in trees, fruits, " vegetables, insects and animals."

The Specification states a theory of the inventor that blight is caused by "minute discharges of electricity," and he pro-

poses to prevent injury to the plants by setting up lightning conductors near the plants. The conductors are in height "by preference about one and a half times that of the plant," and their distance apart equal to their height.

[Printed, 4d. No Drawings.]

A.D. 1866, December 31.—No. 3436.

**EXALL, WILLIAM.**—"Machinery for cutting grass, corn, and similar agricultural produce, and for gathering and binding the same into sheaves."

The cutting apparatus may be of the ordinary character, but the inventor prefers to use "a thin sharp-edged steel band saw or other belt furnished with proper cutters working rapidly over riggers or rollers erected on a proper travelling frame." A stone or other sharpener may be fitted so as to be brought down on the cutters to sharpen them. "As the cut corn falls against the machine, it is seized by a system of travelling fingers or projections and by them working through the proper guides it is gently carried through a suitable conductor towards the side or rear of the machine; and when there is sufficient to form a sheaf a pair of circular arms carrying suitable tyers or bands are made to embrace, compress and properly fasten the sheaf, and by means of cam or other suitable mechanism deliver it on the ground." One mode of tying or fastening is with a string with a loop formed at each end, one of which loops is carried through the other by the closing of the arms, and is caught by a hook which draws it through the loop and effectually fastens the sheaf." The horses may be placed in front or behind, or the machine may be worked by hand power.

[Printed, 1s. Drawings.]

## APPENDIX.

A.D. 1840, September 24.—No. 8644

PINKUS, HENRY.—“Applying motive power to the impelling  
“of machinery”

The invention deals with various applications of electro-motive power, among which is included the working of agricultural implements. Wires from a battery are led over the farm. The frame of the implement used carries an “electro-magnetic engine or machine capable of imparting motion to machinery.” A wire, connected to one of the fixed wires, is wound on a drum so that it can be paid out or taken up as the implement moves backwards and forwards. Tilling tools are mounted at either end of the frame.

[Printed, 6s. 4d. Drawings. See *Mechanics' Magazine*, vol. 34, p. 396; *Inventors' Advocate*, vol. 4, p. 213; *Engineers' and Architects' Journal*, vol. 4, p. 174.]

A.D. 1846, February 11.—No. 11,677

CLARKE, THOMAS, FREEMAN, MARK, and VARLEY, JOHN.—“Obtaining and applying motive power.”

The invention chiefly refers to “atmospheric” railways and engines. Among other applications is one for using the “motive power obtainable from atmospheric pressure to work machinery for tilling land.” The “exhausting power, consisting of a windmill, watermill, steam engine, &c., is to be placed at the centre of the farm, and a system of main and branch pipes is used for communicating power to portable engines. For ploughing, &c., two such engines are used and the implement is drawn to and fro between them by a single rope from the drum on each engine to the implement, the engines winding and unwinding alternately. The drawing shows an implement with the tilling tools arranged diagonally. The rope is supported by “light two-wheeled cars.”

[Printed, 7s. 6d. Drawings. See *Mechanics' Magazine*, vol. 43, pp. 217 and 252; *Engineers' and Architects' Journal*, vol. 10, p. 21.]

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Hickory  
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Hickory  
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Time, applying & destroying

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Small 737

## Loading hvy. draw.

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 Goulding, 735.  
 Wheeler, 736.
- Cutter, revolving;  
 Watts, 27.  
 Cooper, 94.  
 Wolfe, 387.  
 Green, 783.  
 Green, 783.  
 Allott, 803.
- Double-ended plough:  
 MacCarthy, 61.  
 Ray, 27.  
 Lowcock, 136.  
 Warren, 719.  
 Lattar, 730.
- Draught, arrangements for:  
 Stanforth and Pajambe, 6.  
 Lambert, 30.  
 Clymer, 68.  
 Frieson, 69.  
 Stalkart, 71.  
 Wedlake and Wedlake, 75.  
 Armstrong, 81.  
 Campbell and White, 89.  
 Hekford, 96.  
 Campbell and White, 100.  
 Parker, 102.  
 Sanders Williams, Taylor, Armstrong, and David, 124.  
 Bentall, 125.  
 Ransome, May, Biddell, and Worby, 131.  
 Bentall, 281.  
 Arnold, 321.  
 Croley, 343.  
 Blocker, 383.  
 Sack, 443.  
 Gray, 469.  
 Tasker, 613.  
 Seaming, 633.  
 Jones, 653.



Ploughs—*cont.*

Smith 118.  
 Smith 119.  
 Warren, 118.  
 Saunders, Williams, Taylor,  
 Armstrong and David, 124.  
 Boulton, 25.  
 Reilly, 118.  
 Newton 130.  
 Ramsden, May, Biddell, and  
 Worby 131.  
 Lowcock, 136.  
 Morris 145.  
 Brown, 148.  
 Bousier and Pettitt, 153.  
 Osborn 155.  
 Boulton 157.  
 Bryant and Tothill, 161.  
 Huddell, 164.  
 Linn 167.  
 Hazzard 169.  
 Campbell 170.  
 Paul 185.  
 Cochrane 187.  
 Fowler 188.  
 Bennett 189.  
 Boulton, 185.  
 Howard 190.  
 Howard 200.  
 Page 204.  
 Boulton 208.  
 Gillett 209.  
 Marshall 217.  
 Manwaring and Hamblin,  
 221.  
 Abbott, 222.  
 Alabaster 242.  
 Hubbard 244.  
 Flanders 247.  
 Newton 249.  
 Bennett 255.  
 Butterworth, 259.  
 Warren 259.  
 Boulton 260.  
 Smith 271.  
 Nichols 276.  
 Moore 285.  
 Hunt 289.  
 Stevens, 291.  
 Fowler 294.  
 Cole, 297.  
 Hancock, 300.  
 Hirst and 302.  
 Howard 305.  
 Smith 308.  
 Proctor 310.  
 Boulton 311.  
 Plant and Paine, 317.  
 Coleman 319.  
 Arnold 321.  
 Hirst and 321.  
 Walker 324.  
 Howard 327.  
 Williams 330.  
 Howard 345.  
 Clark 350.  
 Evans, 357.

Ploughs—*cont.*

Coleman, 359.  
 Granger 363.  
 Blackwell, 383.  
 Wolfe, 397.  
 Chamberlin, 391.  
 Dray 398.  
 Croan, 416.  
 Slater, 417.  
 Sack 423.  
 De la 428.  
 Wolfe, 455.  
 Coleman, 457.  
 Ball, 458.  
 Platt, 462.  
 Osmund and Collins,  
 Hornsby, 464.  
 Gray 469.  
 Penicoller, 474.  
 Lee, 479.  
 Harker 490.  
 Owen, 492.  
 Barnard 501.  
 Slater, 501.  
 Howard, 510.  
 Wolfe 512.  
 Tasker 513.  
 Parker 514.  
 Walker (Rye), 515.  
 Perry, 516.  
 Bartlett, 517.  
 Lee 519.  
 Fraser 520.  
 Delany (Phelps), 526.  
 Seaman, 533.  
 Taylor 535.  
 Goulding, 536.  
 Russell, 541.  
 Hornsby 551.  
 Jones 551.  
 Wolfe, 551.  
 Chisham, 555.  
 Oliver 573.  
 Hirst, 584.  
 Toomer 590.  
 Green, 593.  
 Enklart, 599.  
 Pencer and Rowland,  
 Edlin et al., 623.  
 Hodson 631.  
 Dixon (Hutchinson),  
 Hirst 640.  
 De Bussche, 644.  
 Jansley, 648.  
 Marshall 670.  
 Bushy, 678.  
 Carter 683.  
 Harrison and Harrison,  
 Roberts and Roberts,  
 Hastings, Fraser,  
 Wolfe, 689.  
 Edington 710.  
 Warren 719.  
 Clark (Peters), 721.  
 Littlewood 733.  
 Goulding 735.  
 Lister, 736.

Ploughs—*cont.*

Wheeler, 736.  
 Lee, 743.  
 Pagny, 745.  
 Gedze (*Clamegeran*), 749.  
 Lee and Gutteridge, 757.  
 Buckinghorn, 759.  
 Mellard, 762.  
 Sean an, 762.  
 Roberts, 769.  
 Simmons, 770.  
 Gedze (*Pharrier*), 783.  
 Green, 783.  
 Green, 786.  
 Gedze (*Clamegeran*), 790.  
 Ransome, Ransome, and  
 Ransome, 794.  
 Johnson (*Donin*), 794.  
 Allott, 808.  
 Dickson, 808.  
 Dannatt, 820.  
 Hopkins and Culpin, 831.  
 Skelton, 832.  
 Gray, Gray, and Gray, 839.  
 Stalkart, 842.  
 Edly, 848.  
 Eddington, 848.  
 Lornier, 866.  
 Homer, 869.  
 Mills (*Collins Co.*), 864.  
 Volkmann, 891.  
 Beams, *anted*;  
 Cooke, 40.  
 Smith, 104.  
 Campbell, 179.  
 Lansley, 203.  
 Capstons, drawing ploughs by;  
 Lambert, 30.  
 Dobbs, 33.  
 Hickford, 46.  
 Cooper, 66.  
 Cooper, 98.  
 Fowler, 185.  
 Fowler, 193.  
 Cones or balls attached to  
 share.  
 Lambert, 30.  
 Coulter,  
 Saxter, 98.  
 Benerville, 86.  
 Cooke, 40.  
 M. Carthy, 61.  
 Thomas, 64.  
 Clymer, 68.  
 Finlayson, 69.  
 Stothert, 71.  
 Armstrong, 81.  
 Palmer, 102.  
 Saunders, Williams, and  
 Taylor, 103.  
 Hutton, 106.  
 Bentall, 125.  
 Ransome, May, Biddell,  
 and Worby, 131.  
 Huddart, 164.  
 Campbell, 179.

Ploughs—*cont.*

Coulter—*cont.*  
 Blakemore, 195.  
 Howard, 196.  
 Manwaring and Hamblin,  
 221.  
 Planders, 247.  
 Herbertson, 253.  
 Nicholls, 276.  
 Stevenson, 286.  
 Armelin, 321.  
 Walker, 326.  
 Coggin, 416.  
 Wolfe, 455.  
 Hornsby, 468.  
 Gray, 469.  
 Owen, 492.  
 Walter (*Rogers*), 514.  
 Wolfe, 554.  
 Ollivier, 573.  
 Dixon (*Harfacine*), 582.  
 De Roumout, 644.  
 Gould & S., 736.  
 Wheeler, 736.  
 Cutler, revolving;  
 Watts, 27.  
 Cooper, 98.  
 Woods, 387.  
 Green, 783.  
 Green, 786.  
 Allott, 803.  
 Double-ended plough;  
 Mac Carthy, 61.  
 Hay, 97.  
 Lowcock, 136.  
 Warren, 719.  
 Lutter, 776.  
 Draught arrangements for;  
 Stanforth and Poljambe,  
 8.  
 Lambert, 30.  
 Clymer, 68.  
 Finlayson, 69.  
 Skelton, 71.  
 Weddell and Wedlake, 75.  
 Armstrong, 81.  
 Campbell and White, 69.  
 Huddart, 164.  
 Campbell and White, 100.  
 Palmer, 102.  
 Smith, 104.  
 Sanders, Williams, Taylor,  
 Armstrong, and David,  
 123.  
 Bentall, 125.  
 Ransome May, Biddell, and  
 Worby, 131.  
 Bentall, 125.  
 Armelin, 321.  
 Gray, 469.  
 Blackwell, 383.  
 Beck, 443.  
 Gray, 469.  
 Tasker, 514.  
 Berman, 531.  
 Jones, 553.

Ploughs—*cont.*

## Shares, making:

- Ransome, 16.
- Snart, 25.
- Ransome, 37.
- Ransome, 54.
- Wedlake and Wedlake, 75.
- Spruall and Ransome, 77.
- Campbell and White, 80.
- Sauers, Williams, Taylor, Armstrong, and David, 124.
- Armstrong, 331.
- Stitch, 361.
- Walter, Rogers, 515.
- Olay, 573.
- Golding, 735.
- Ransome, Ransome, and Ransome, 794.
- Gray, Gray, and Gray, 839.

## Shares, rotary:

- Flinders, 247.
- Cole, 297.

## Shares, sowing:

- Southern, 286.
- Bonslerk, 311.
- Chambers, 395.
- Thurington, 402.
- Platt, 502.
- Brennan, 501.
- Homes, Ransome, 709.
- Brooman (De Gabriac), 736.
- Dickson, 808.

## Shares, shape of:

- Saunter, 28.
- Coke, 40.
- Linton, 51.
- Bernard, 55.
- Plenty, 57.
- Ransome, 58.
- MacCarthy, 61.
- Thomas, 64.
- Ransome and Ransome, 66.
- Philson, 69.
- Wedlake and Wedlake, 75.
- Spruall and Ransome, 77.
- Armstrong, 81.
- Hackvale, 80.
- Bentall, 112.
- Warren, 118.
- Sauers, Williams, Taylor, Armstrong, and David, 124.
- Bentall, 137.
- Reynold, 194.
- Flinders, 247.
- Armstrong, 331.
- Blackwood, 383.
- Gray, 398.
- Cochran, 437.
- Hall, 458.
- Hornsby, 468.
- Lee, 578.
- Hornsby, 557.
- Cichowaki, 598.

Ploughs—*cont.*Shares, shape of—*cont.*

- Hornsby, 610.
- De Gabriac, 644.
- Gray, 785.
- Green, 786.
- Dunlop, 829.
- Stakurti, 842.
- Eddy, 843.

## Stills, fitting:

- Stanforth and Poljanec, 31.
- Locher, 31.
- MacCarthy, 61.
- Boris, 125.
- Boris, 204.
- Bentall, 281.
- Duggan, H. (Latham), 600.
- Hornby, 640.
- Warren, 719.
- Gentling, 735.
- Lee, 743.
- Lee and Gutteridge, 757.
- Roberts, 769.

## Stills, making:

- Newell, 239.
- Blanchard, 324.

## Turf cutters:

- Hazeldine, Hazeldine, 7.

## Turn-worms, ploughs:

- Ransome, 42.
- Pratt, 44.
- Campbell and White, 100.
- Reed, 127.
- Bentall, 204.
- Hornby, 240.
- Hornby, 255.
- Pennington, 274.
- Tosner, 500.
- Birdy, 675.
- Sauers, 770.
- Johnson (Lynch), 784.
- Skilton, 832.
- Eddy, 843.

## Vineyards, ploughs for:

- Gilbert, 670.
- Gilbert, 670.

## Wheels, fitting:

- MacCarthy, 61.
- Lee, 578.
- Hornby, 557.
- MacCarthy, 61.
- Thomas, 64.
- Campbell and White, 80.
- Cochran, 437.
- Campbell and White, 100.
- Dunlop, 829.
- Bentall, 125.
- Reed, 127.
- Bentall, 37.
- Campbell, 170.
- Bentall, 38.
- Hornby, 190.
- Vogel, 204.

Ploughs—*cont.*

Wheels, fitting—*cont.*

- Marshall, 217.
- Marwaring and Hamblin, 221.
- Abbott, 222.
- Albright, 242.
- Herlan, 246.
- Hill, 250.
- Neale, 276.
- Moore, 278.
- Bentall, 283.
- Smith, 308.
- Plenty and Pain, 317.
- Howard, 327.
- Groley, 363.
- Suck, 444.
- Woolf, 465.
- Hackes, 490.
- Woolf, 612.
- Lee, 518.
- Goulding, 650.
- Russe, 657.
- Dixon, (*Montpelier*), 633.
- Hemphys, 640.
- Bushy, 678.
- Goulding, 785.
- Seaton, 792.
- Daniell, 820.
- Volkman, 891.

Ploughs, drain. *See also*  
Drains, machines for  
cutting :

- Moore, 8.
- Watts, 27.
- Lambert, 30.
- Dobbs, 48.
- Huckford, 46.
- Cowper, 65.
- Campbell and White, 80.
- Hackney, 86.
- Cowper, 88.
- Campbell and White, 100.
- Warner, 118.
- Rend, 127.
- Ross and May, Biddell, and Worby, 131.
- Morris, 145.
- Bryant and Tothill, 161.
- Powder, 185.
- Cotterell, 187.
- Fowler, 193.
- Fowler, 204.
- Hancock, 300.
- Smith, 308.
- Prinsep, 310.
- Beauchamp, 311.
- Fewer, 341.
- Eddington, 323.
- Stave, 364.
- Carter, 383.
- Eddington, 710.
- Eddington, 846.

Ploughs, paring :

- Stangforth and Foljambé, 2.
- Barster, 28.
- Bent, 153.
- Bentall, 167.
- Bryant and Tothill, 161.
- Benda, 194.
- Flinders, 247.
- Nichols, 250.
- Bentall, 283.
- Collins, 350.
- Kenna, 357.
- Woolf, 387.
- Woolf, 464.
- Newington, 502.
- Woolf, 612.
- Perry, 616.
- Taylor, 615.
- Burrow, 644.
- Osborne, 745.
- Hornby, Bonnell, and Astbury, 792.

Ploughs, steam :

- Pratt, 44.
- Reynolds, 57.
- Clive, 73.
- Pinkus, 91.
- Osborn, 155.
- Luke, 167.
- Chippes, 238.
- Curtis, 241.
- Atkins, 285.
- Williams, 288.
- Williams, 310.
- Fisher and Paken, 320.
- Halkett, 331.
- Lacy, 337.
- Williams, 330.
- Smith, 343.
- Fowler, 344.
- Fowler and Greig, 340.
- Coleman, 350.
- Howard and Baker, 361.
- Groley, 363.
- Fowler and Worby, 360.
- Fowler, 381.
- Chamberlin, 395.
- Williams, 397.
- Eddington, 413.
- Masey and Smith, 414.
- Fowler and Worby, 410.
- Coleman, 430.
- Fowler and Worby, 453.
- Austin, 456.
- Platt, 462.
- Crowley, 461.
- Seaman, 472.
- Smith (*King's*), 473.
- Chadler and Oliver, 478.
- Han, 492.
- Chadler and Oliver, 497.
- Fowler, Bonnell, and Greig, 499.
- Newington, 502.
- Hornby, 506.

Ploughs—*cont.*

## Shares, making.

- Ransome, 15.
- Smart, 26.
- Ransome, 37.
- Ransome, 53.
- Wedlake and Wedlake, 75.
- Spragell and Ransome, 77.
- Campbell and White, 89.
- Sanders, Williams, Taylor, Armstrong, and David, 124.
- Armstrong, 321.
- Storer, 501.
- Waller (Rogers), 513.
- Oltner, 514.
- Goulding, 735.
- Ransome, Ransome, and Ransome, 794.
- Ormy, Gray, and Gray, 839.

## Shares, rotary:

- Panders, 247.
- Cole, 297.

## Shares, screw.

- Southon, 206.
- Bean, Lock, 311.
- Chamberlain, 395.
- Thornington, 402.
- Platt, 402.
- Brennan, 501.
- Holmes (Ransome), 709.
- Broomer (Dr. Gaborac), 735.
- Dickson, 808.

## Shares, shape of.

- Snitzer, 28.
- Cooke, 40.
- Laston, 51.
- Bennett, 65.
- Plenty, 50.
- Ransome, 58.
- MacCarthy, 61.
- Thomas, 64.
- Ransome and Ransome, 66.
- Fennell, 68.
- Wedlake and Wedlake, 75.
- Spragell and Ransome, 77.
- Armstrong, 81.
- Hickson, 83.
- Bentall, 112.
- Warren, 113.
- Sanders, Williams, Taylor, Armstrong, and David, 124.
- Bentall, 127.
- Bentall, 134.
- Flinders, 147.
- Armstrong, 321.
- Blackwell, 335.
- Dray, 336.
- Coleman, 437.
- Rail, 438.
- Horsley, 449.
- Lee, 514.
- Horsley, 537.
- Cichowaki, 508.

Ploughs—*cont.*Shares, shape of—*cont.*

- Horsley, 537.
- De Bosc, 540.
- Green, 743.
- Green, 746.
- Daniell, 751.
- Stalkart, 742.
- Edly, 243.

## Stills, fitting.

- Stanforth and Foljambe, 124.
- Lea, 121, 30.
- MacCarthy, 61.
- Bentall, 127.
- Bentall, 204.
- Bentall, 205.
- Horse (Horsley), 637.
- Horse, 740.
- Warren, 741.
- Goulding, 735.
- Lee, 743.
- Lee and G. Herdridge, 757.
- Roberts, 769.

## Stills, making.

- Newell, 240.
- Blanchard, 324.

## Turf cutters:

- Hazeldine (Hazelwood), 6.

## Turn-wrest ploughs.

- Ransome, 42.
- Proft, 46.
- Campbell and White, 100.
- Ransome, 27.
- Bentall, 204.
- Horsley, 240.
- Horsley, 255.
- Penney, 474.
- Tromper, 500.
- Bush, 674.
- Sanderson, 771.
- Johnson (Horsley), 794.
- Stalkart, 802.
- Edly, 843.

## Vineyards, ploughs for.

- Gilby (Horsley), 700.
- Godge (Horsley), 700.

## Wheels, fitting.

- Mason, 8.
- Laston, 51.
- Brown (Ransome), 57.
- MacCarthy, 61.
- Thomas, 64.
- Campbell and White, 68.
- Coxeter, 68.
- Campbell and White, 100.
- Horsley, 107.
- Bentall, 127.
- Bentall, 127.
- Campbell, 127.
- Ransome, 104.
- Howard, 109.
- Pape, 104.

**ays, endless :**

H. at coast, 74.  
Hart, 343.  
Cant ridge, 377.  
Cant ridge, 396.  
Kientz, 384.  
Kientz, 389.  
Bethell 447.  
Smith, *Allegie*, 473.  
Roman, 461.  
Von Kank, 509.  
Grafton, 622.  
Hall, 999.

**ays, farm :**

Westley, 285.  
Hale, 333.  
Hart, 343.  
Cambridge, 377.  
Cambridge, 390.  
Moody, 475.  
Winder, 543.

**ays, horse :**

Grant, 114.  
Garrett, 121.  
Saunders, Williams, Taylor,  
Armstrong, and David,  
124.  
Ransome, May, Biddell, and  
Worby, 131.  
Smith, 149.  
Howard, 275.  
Smith, 340.  
Colin, 350.  
Morychurch and Griffiths,  
354.  
Beafor, 363.  
Carmichael, 367.  
Smith, 368.  
Deans, 371.  
Kieba, 434.  
Luck, 470.  
Lars, 479.  
Fennell, 480.  
W. (R. Gers), 515.  
Taylor, 545.  
Pace, 547.  
Howard, 542.  
Nicholson, 553.  
Deans, 574.  
Howard, 579.  
Brooman (*Hamor*), 600.  
Carmichael, 611.  
Winder, 644.  
Garrood, 646.  
Smith and Taylor, 659.  
Hawes, 667.  
Cooper and Garrood, 676.  
Wad, 691.  
Sharp, 696.  
Drummond, 703.  
Atcock, 712.  
W. (H. Fells), 732.  
Wright and Denning,  
754.  
Lee and Gutteridge, 767.

**Rakes, horse—cont.**

Barwell, 763.  
Perkins, 770.  
Robins, *Beccal*, 579.  
Maynard and Maynard, 571.  
Rakes and Watis (*Adela*  
*Jepp*), 540.  
Howes and Hardy, 596.

**Rakes, steam :**

Pord, 322.  
Halkett, 373.  
Vez, Kar, 509.  
Taylor, 545.  
Brooman (*De Gabriel*), 724.

**Reaping hooks. See Sickles.**

**Reaping machines :**

Boyle, 30.  
McAres, 52.  
Puckett, 53.  
Cummings, 48.  
Tindal, 52.  
Dobbs, 53.  
Duncan, 100.  
Phillips, 100.  
Phillips, 124.  
Gibson, 159.  
Laird, 167.  
Whitworth, 163.  
Brooman, 190.  
Eral, 203.  
Stacey, 203.  
Dray (*Honey*), 206.  
Riley, 207.  
Poon, 211.  
Sams, 211.  
Smith, 213.  
Randle, 214.  
Brooman, 214.  
Smith, 216.  
Poon, 220.  
Riley, 220.  
Cromwell, 221.  
Dray, 222.  
Fowler, 225.  
Newt. (*Honey*), 226.  
Phillips, 229.  
Hussey, 231.  
Johnson, 231.  
Jeffrey, 235.  
Hutch, 240.  
Underhay, 240.  
Bramwell, 242.  
Francis, 244.  
Frost, 244.  
Harrison, 247.  
Hollford, 247.  
Foster, 247.  
Brooman, 249.  
Hutch, 249.  
Underhay, 249.  
Kealy, 250.  
Kingston, 251.  
Johnson, 253.

Guides are fitted on the frame which rest on the ground, and thereby regulate the depth of the trench.

[Printed, 8d. Drawings.]

A.D. 1866, December 21.—No. 3368.

HOWARD, JAMES.—(*A communication from James Shorkley Marsh.*)—"Mowing and reaping machines."

The machine has two bearing wheels, between which is a table or platform to which the gear-work is attached. The finger bar, &c. is fixed to a "drag bar" the ends of which are connected to levers, one of which passes in front of the inner driving wheel, and the other behind it. A system of levers is arranged for raising and lowering the drag bar levers, so as to adjust the height of the cutters. When required, the drag bar and cutters can be turned up for purposes of transport. The grain platform is carried by adjustable castor wheels. The raking apparatus is carried by the platform, and is free to rise and fall therewith. To give sufficient strength there is an "arched casting" which "spans the finger bar, and through it the sickle bar works, one leg of the casting being secured to the drag bar, and the other to the grain platform." A crown wheel pivotted on the top of this casting carries the rakes, and gives them the necessary rotary motion. The rake arms are raised and lowered by working over cam surfaces on the casting. "The rake bars carrying the teeth which remove the cut corn from the platform are hinged to the carrying arms, and they are held in position by a spring catch. This arrangement allows of the teeth of any one of these bars being turned out of the way when required, and the toothed bar will thus become a simple gatherer." The rake arms are connected by tie rods so that they balance one another.

[Printed, 1s. 2d. Drawings.]

A.D. 1866, December 28.—No. 3403.

ABEL, CHARLES DENTON.—(*A communication from John Francis Bennett.*)—(*Provisional protection only.*)—"Prevention of 'rot' in potatoes and grapes, and the similar blight in trees, fruits, vegetables, insects and animals."

The Specification states a theory of the inventor that blight is caused by "minute discharges of electricity," and he pro-



poses to prevent injury to the plants by setting up lightning conductors near the plants. The conductors are in height "by preference about one and a half times that of the plant," and their distance apart equal to their height.

[Printed, 4d. No Drawings.]

A D. 1866, December 31.—No. 3436.

**EXALL, WILLIAM**—"Machinery for cutting grass, corn, and "similar agricultural produce, and for gathering and binding "the same into sheaves."

The cutting apparatus may be of the ordinary character, but the inventor prefers to use "a thin sharp-edged steel band saw "or other belt furnished with proper cutters working rapidly "over riggers or rollers erected on a proper travelling frame." A stone or other sharpener may be fitted so as to be brought down on the cutters to sharpen them. "As the cut corn falls "against the machine, it is seized by a system of travelling "fingers or projections and by them working through the "proper guides it is gently carried through a suitable conductor towards the side or rear of the machine, and when "there is sufficient to form a sheaf a pair of circular arms "carrying suitable tyers or bands are made to embrace, "compress and properly fasten the sheaf, and by means of "cam or other suitable mechanism deliver it on the ground." One mode of tying or fastening is with a string with a loop "formed at each end, one of which loops is carried through "the other by the closing of the arms, and is caught by a "hook which draws it through the loop and effectually fastens "the sheaf." The horses may be placed in front or behind, or the machine may be worked by hand power.

[Printed, 1s. Drawings.]

## Reaping machines—cont.

Bands for sheaves, preparing:  
Braham and Bickerton, 770.

Blast of air to lay crop:  
Fowler, 225.  
Statham and Statham, 630.

Cutter, screw:  
Earl, 388.  
Ridley, 687.

Cutters, fixed.  
Patterson, 279.  
Ponto remoreau, 235.  
Varley, 715.  
Sims, 773.  
Pidgeon and Manwaring,  
790.

## Cutters on endless bands:

Lilac, 107.  
Egan, 345.  
Sang, 211.  
Jones, et, 339.  
Lewis, 404.  
Law, 541.  
Osmond, 003.  
Radley, 620.  
Bellfield, 624.  
Savage, 646.  
Moore, 806.  
Exall, 897.

## Cutters on vertical spindles or drum.

Boyer, 50.  
Pilknett, 38.  
Cunning, 48.  
Tindall, 62.  
Dunn, 106.  
Phillips, 100.  
Phillips, 128.  
Gibson, 158.  
Whitworth, 163.  
Smith, 213.  
Smith, 216.  
Phillips, 228.  
Jeffrey, 235.  
Burch, 240.  
Brinsford, 242.  
Frost, 244.  
Brooman, 245.  
Underhay, 249.  
Knox, 250.  
Eaton, 251.  
Whitworth, 258.  
Coffin, 264.  
Tracy and Tracy, 264.  
Vane, 265.  
Harker, 267.  
Newton, 270.  
Wright, 270.  
Austin, 272.  
Beaumont, et, 280.  
Phillips, 280.  
Baxter, 301.  
Bradley, 329.  
Jones, et, 339.  
Sticks, 379.

## Reaping machines—cont.

Cutters on vertical spindles or drum, cont.  
Cott, 386.  
Pilknett, 413.  
Newton, 419.  
Eaton and Roskill, 431.  
Hart, 476.  
Bates, 490.  
Champersey, 530.  
Adams, 774.  
Browne (Adam), 794.

## Cutters, reciprocating blades:

Dray (Hewsey), 302.  
Bamford, 314.  
Brooman, 314.  
Poole, 320.  
Dray, 322.  
Newton (Mansy), 326.  
Hewsey, 331.  
Belford, 344.  
Newton (Hewsey), 373.  
Mabey (Mansy), 374.  
Harwood, 443.  
Martins, 493.  
Mann, 545.  
Harwood, 575.  
Barnett, 584.  
Samuelson, 592.  
Gardner and Lindsay, 614.  
Smith, 627.  
Statham and Statham, 630.  
Newton (Van Anden), 630.  
Bamford, 638.  
Rowley, 643.  
Gedge (Inchotons), 651.  
Braze, 657.  
Gibson, 672.  
Newton (Van Anden), 674.  
Wallace, 683.  
Brooman (Hewsey), 691.  
Childs Roy Redstone and Redstone, 704.  
Newton (Inchotons), 713.  
Varley, 718.  
Hewsey (Hubbard), 726.  
Martin, 728.  
Harker, 737.  
Crampton, 738.  
Pursons (Wood), 739.  
Pursons (Wood), 746.  
Sims, 753.  
Mitchell, 757.  
Wallace, 760.  
Peters and Harker, 802.  
Newton (Karchner), 813.  
Webb, 861.  
Whitaker, 871.  
Hewsey, 873.  
Law, 883.  
Howard and Onfield, 883.

## Cutters, serrated piston, reciprocating.

Phillips, 134.  
Brooman, 186.  
Johnson, 231.  
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Cutters, serrated plates, reciprocating *cont.*

Patterson, 261.  
Robertson and Henry, 334.  
Jonquet, 330.  
Lewis, 404.  
Evans, 412.  
Thomier, 637.

Cutters, turning up;

Mayer, 254.  
Trotter, 511.  
Newton, (*Adrianse*), 511.  
Tyler, 542.  
Burgess, 569.  
Joslin, Joslin and Joslin, 597.  
Samuelson, 617.  
Newton (*Van Anden*), 675.  
Warby, 708.  
Parsons (*Wood*), 730.  
Parsons (*Wood*), 736.  
Wickens (*Allen*), 758.  
Hornsbly and Phillips, 784.  
Brown, Kniffen and Dodge, 789.

Barber, 800.  
Chiles (*Allen*), 831.  
Rousfield (*Tindall*), 834.  
Manwaring, 845.  
Whitaker, 871.  
Hornsbly and Phillips, 881.  
Howard (*Marsh*), 896.

Cutters vibrating on pivots;

Stacey, 205.  
Riley, 207.  
Hidley, 220.  
Varley, 235.  
Russell, 302.  
Dyke, 333.  
Jonquet, 330.  
Thomson, 391.  
Thompson (*Thompson*), 404.  
Robin, 608.  
Dennison, 701.

Delivery by Archimedean screws;

Burgess, 200.  
Burgess, 323.  
Munn, 556.  
Low, 591.

Delivery by endless bands;

Cammick, 48.  
Dunham, 136.  
Exall, 205.  
Stacey, 205.  
Riley, 207.  
Sarg, 211.  
Dray, 222.  
Phillips, 223.  
Brinsmead, 232.  
Whitwort, 256.  
Patterson, 261.  
Wardell, 407.

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Delivery by endless bands—*cont.*

Newton, 519.  
Wardell, 475.  
Robin, 608.  
Wardell and Kearsley, 638.  
Bamlett, 639.  
Dona, 640.  
Craxton (*Wood*), 658.  
Bell, 662.  
Harwood, 675.  
Dray and Gardiner, 698.  
Creaser, 691.  
Douglas, 698.  
Hollard, 614.  
James, 617.  
Beckfield, 624.  
James, 634.  
Brookman (*Clement*), 701.  
Craxton, 723.  
Hornsbly and Phillips, 784.  
Hornsbly, 836.  
Norfolk, 889.

Delivery by rollers;

Fowler, 223.  
Palmer, 332.  
Wardell, 475.  
Burgess, 774.

Dividers;

Dray (*Hussey*), 208.  
Brookman, 214.  
Smith, 216.  
Poole, 230.  
Riley, 220.  
Phillips, 223.  
Mayer, 254.  
Austin, 272.  
Phillips, 200.  
Russell, 302.  
Palmer, 332.  
Dyke, 333.  
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Storke, 378.  
Clark (*Wood*), 445.  
Hixon, 476.  
Hollard, 614.  
Bamlett, 639.  
Burgess, 656.  
Burgess, 666.  
Samuelson and Manwaring, 670.  
Harwood, 675.  
Craxton and Craxton, 698.  
Joslin, Joslin and Joslin, 597.  
Dray and Gardiner, 698.  
Creaser, 691.  
Hollard, 614.  
Newton (*Van Anden*), 675.  
Bamlett, 637.  
Gedde (*Duchateau*), 683.  
Newton (*Russell and Thompson*), 688.  
Bamlett, 687.

Reaping machines—*cont.*Dividers—*cont.*

Cranston (Wood), 692.  
 Broomeau (Clement), 701.  
 Newton (Osborne), 713.  
 Haseltine (Hubbard), 720.  
 Wickens (Allen), 758.  
 Manwaring, 764.  
 McCormick, 771.  
 Brown, Kniffen and Dodge,  
 780.  
 Barber, 800.  
 Cranston (Wood), 819.  
 Childs (Allen), 831.  
 Manwaring, 857.  
 Haseltine (Perry), 861.  
 Howard (Marsh), 890.

## Driving gear.

Phillips, 109.  
 Phillips, 128.  
 Bidley, 207.  
 Poole, 211.  
 Bantel, 214.  
 Smith, 228.  
 Poole, 229.  
 Bidley, 230.  
 Dray, 292.  
 Phillips, 323.  
 Monahan, 345.  
 Russell, 362.  
 Ditz and Dunham, 363.  
 Robertson and Henry, 334.  
 Tolhansen (Henderson and  
 Corp.), 341.  
 Thurlow, 391.  
 Newton, 403.  
 Mickle, 406.  
 Newton, 434.  
 Hurwood, 443.  
 Clark (Wood), 465.  
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 Newton, 503.  
 Wardell and Kearley, 529.  
 Bantlett, 539.  
 Tycer, 549.  
 Hall, 552.  
 Wray and Wray, 553.  
 Munn, 569.  
 Stewerthorn (Leroy), 559.  
 Samuelson and Manwaring,  
 570.  
 Harwood, 575.  
 Cross (and Crosskill), 583.  
 Bantlett, 584.  
 Burrows, 586.  
 Nichols, 592.  
 Crosser, 591.  
 Bantlett, 604.  
 Nicholson, 607.  
 Hall, 608.  
 Phillips (Whithead), 609.  
 Heibel, 614.  
 Samuelson, 617.  
 Bailey, 620.  
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 625.  
 Smith, 627.

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Poole, 211.  
 Ran 1-11, 214.  
 Brooman, 214.  
 Poole, 220.  
 Dray, 222.  
 Newton (*Manny*), 226.  
 Patterson, 201.  
 Campbell, 355.  
 Charlwood, 431.  
 Gill, 423.  
 Newton, 503.  
 Newton, 507.  
 Cranston (*Wood*), 537.  
 Samuelson and Shaw, 566.  
 Murn, 566.  
 Gillespie and Gillespie, 577.  
 Crosser, 601.  
 Bamlett, 604.  
 James, 617.  
 James, 614.  
 Bamlett, 634.  
 Harwood, 619.  
 Bragg, 637.  
 Gibson, 672.  
 Burgess, 674.  
 Brooman (*Mazier*), 691.  
 Newton (*Osborne*), 713.  
 Haseltine (*Hubbard*), 720.  
 Barber, 800.  
 Fletcher, 818.  
 Childs (*Allen*), 821.

Hand reapers:

Meares, 32.  
 Dobbs, 53.  
 Collett, 386.  
 Mickle, 406.  
 Collier, 535.  
 Koch, 569.  
 Brooman (*Leptos*), 593.  
 Baileul, 577.  
 Robertson and Waddell, 594.  
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Height of cutters, adjusting:

Bidley, 207.  
 Randall, 214.  
 Brooman, 214.  
 Smith, 218.  
 Bailey, 220.  
 Dray, 222.  
 Newton (*Manny*), 226.  
 Kealy, 250.  
 Patterson, 279.  
 Varley, 298.  
 Crosskill, 314.  
 Campbell, 355.  
 Mable (*Manny*), 374.  
 Thurlow, 391.  
 Thompson (*Thompson*), 404.  
 Mickle, 406.  
 Charlwood, 431.  
 Gill, 423.  
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Height of cutters, adjusting—cont.

Newton, 507.  
 Trotter, 511.  
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 Cranston (*Wood*), 537.  
 Burgess, 569.  
 Harwood, 575.  
 Bamlett, 604.  
 Ha, 608.  
 He and, 614.  
 Harwood, 619.  
 Newton (*Russell and Tre-*  
*man*), 629.  
 Burgess, 674.  
 Bamlett, 687.  
 Brooman (*Mazier*), 691.  
 Cranston (*Wood*), 692.  
 Haseltine (*Hubbard*), 720.  
 Harkes, 727.  
 Parsons (*Wood*), 739.  
 Parsons (*Wood*), 739.  
 Brigham and Bickerton, 750.  
 Bamlett, 753.  
 Manwaring, 764.  
 Sims, 773.  
 Hornsby and Phillips, 784.  
 Crampton (*Wood*), 785.  
 Brown, Kniffen and Dodge, 789.  
 Barber, 800.  
 Peters and Harkes, 802.  
 Bamlett, 814.  
 Cranston (*Wood*), 819.  
 Childs (*Allen*), 821.  
 Hornsby, 823.  
 Burgess, 847.  
 Aug. wood, 849.  
 Wells, 851.  
 Burger (*Poll and Angelo*), 859.  
 Whitaker, 871.  
 Hornsby, 873.  
 Howard (*Morsh*), 896.

Platforms.

Plucknett, 38.  
 Crampton, 43.  
 Dobbs, 53.  
 Duigan, 106.  
 Phillips, 109.  
 Gibson, 154.  
 Brooman, 198.  
 Smith, 213.  
 Randall, 214.  
 Brooman, 214.  
 Newton (*Manny*), 226.  
 Brooman, 244.  
 Dray, 222.  
 And n, 272.  
 Fontaine, 286.  
 Varley, 298.  
 Roberts and Henry, 334.  
 Mable (*Manny*), 374.  
 Burgess, 425.

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Gilt, 425.  
 Evans and Roskell, 453.  
 Harwood, 448.  
 Latis, 485.  
 Marcus, 495.  
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 Trotter, 511.  
 Clumpney, 530.  
 Eddy, 546.  
 Deas, 549.  
 Wray and Wray, 553.  
 Ennis, 561 and Shaw, 559.  
 Cranstall (Wood), 558.  
 Burrows, 568.  
 Harwood, 575.  
 Gilchrist and Gillespie, 577.  
 Cranston, Wood and  
     Wood, 593.  
 Dray and Gardiner, 598.  
 Bain, 601, 602.  
 Hall, 604.  
 Helward, 614.  
 Southerton and Carr, 617.  
 Samuelson, 617.  
 James, 654.  
 Geddes (Duchateau), 653.  
 Samuelson (Duchateau), 603.  
 Hunter and Scott, 604.  
 Dennis, 701.  
 Worba, 709.  
 Ralph, 725.  
 Harker, 737.  
 Benson, (Lilpop), 739.  
 Parsons (H. M.), 739.  
 Parsons (Wood), 746.  
 Bunnett, 753.  
 Grace, 766.  
 Hendry and Phillips, 768.  
 Gray, 771.  
 McCracken, 771.  
 Stiles, 773.  
 Benson, 774.  
 Hendry and Phillips, 784.  
 Pittman and Mauwaring,  
     790.  
 Wallace, 796.  
 Bain, 814.  
 Benson, 821.  
 Walton, 824.  
 Barber, 835.  
 Manwaring, 845.  
 Boyd, 849.  
 Underhill, Gordon, and Gor-  
     don, 881.  
 Trevelyan and Bickerton,  
     883.  
 Harker, 885.  
 Benson (Bill and Angelo),  
     889.  
 Gordon, 892.  
 Hendry and Phillips, 881.  
 Lister, 881.  
 H. and Marsh, 906.  
 Ewald, 897.

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## Bakes, del vey.

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Reaping machines—*cont.*

Rakes, delivery—*cont.*  
 Wardlaw, 891.  
 Howard and Bousfield, 888.  
 Turner, 893.  
 Howard (*Marsh*), 896.

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 Gibson, 188.  
 Ezell, 203.  
 Mann, 550.  
 Bell, 565.  
 Hornsby and Phillips, 768.

Reaper and plow combined;  
 Lancaster, 819.

Reaping and thrashing machine,  
 combined.  
 Ridley, 633.  
 Gilbee (*Gorel*), 642.

Reels;  
 Cumming, 48.  
 Phillips, 109.  
 Broome, 196.  
 Smith, 216.  
 Crosskill, 221.  
 Dray, 222.  
 Burgess, 425.  
 Hellard, 523.  
 Wardell and Kearsley, 523.  
 Bamlett, 539.  
 Hall, 562.  
 Mann, 566.  
 Harwood, 575.  
 Gillespie and Gillespie,  
 577.  
 Cresser, 601.  
 Hal, 608.  
 Hellard, 614.  
 Ash (*Cooper*), 660.  
 Newton, (*Russell and Tre-  
 maine*), 669.  
 Burgess, 674.  
 Bamlett, 687.  
 Newton (*Ophorne*), 713.  
 Haseltine (*Hubbard*), 720.  
 Manwaring, 764.  
 Burgess, 765.  
 Burgess, 774.  
 Hornsby and Phillips, 794.  
 Crichley (*Bodington*), 814.  
 Bamlett, 814.  
 Walton, 818.  
 Bousfield (*Tindall*), 824.  
 Barber, 834.  
 Brigham and Bickerton,  
 853.  
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 Bousfield, 877.  
 Burgess, 879.  
 Manwaring, 883.  
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 Austin, 272.  
 Young, 290.  
 Tolhansen (*Durand*), 638.  
 Tolhansen (*Durand*), 681.

Reaping machines—*cont.*

Self binders—*cont.*  
 Childs (*Hay, Redstone, and  
 Redstone*), 704.  
 Sheldon (*Goodyear*), 855.  
 Ezell, 847.

Shears on wheeled frame;  
 Menros, 22.

Sheaves, delivering in;  
 Stacey, 205.  
 Dray (*Hussey*), 208.  
 Ruck, 207.  
 Smith, 219.  
 Ruck, 220.  
 Phillips, 228.  
 Briggs, 242.  
 Bickford, 246.  
 Muzzey, 254.  
 Newton, 270.  
 Tolhansen, (*Henderson and  
 Corry*), 341.  
 Campbell, 345.  
 Newton (*Hussey*), 373.  
 Ward, 407.  
 Newton, 410.  
 Gil, 425.  
 Clark (*Corry*), 428.  
 Harwood, 443.  
 Carr, 467.  
 Ward, 475.  
 Drummond, 499.  
 Hellard, 523.  
 Ward and Kearsley, 529.  
 Chapman, 630.  
 Banditt, 639.  
 Hall, 652.  
 Mann, 656.  
 Bousfield, 684.  
 Dray and Gardner, 698.  
 Burgess, 698.  
 Hellard, 614.  
 Ransom (*Robinson*), 647.  
 Humpage, 660.  
 Ruck, 720.  
 Ransom (*Lilpop*), 738.  
 Greer, 760.  
 Corry, 771.  
 Brigham and Bickerton,  
 779.  
 Hornsby and Phillips, 794.  
 Bamlett, 814.  
 Brenton, 814.  
 Harwood, 835.  
 Byford, 859.  
 Hornsby and Phillips, 881.  
 Manwaring, 883.  
 Wardlaw, 886.  
 Turner, 893.

Swinging sections;  
 Underhay, 240.  
 Bailey, 877.

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Phillips, 101.  
 Lillie, 167.  
 Johnson, 233.  
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Fisher and Fisher, 326.  
Hinkett, 333.  
Robertson and Henry, 334.  
Lucy, 340.  
Barratt and Barratt, 378.  
Bushman, 400.  
Barratt and Barratt, 436.  
Banks, 310.

Wilson, #34.

Hayes, 28.  
Herriman, 39.  
Edna 43, 104.  
Crossak 1, 114.  
Hall, 122.  
Cambr age, 138.  
Maberly, Geary, and Crou-  
cher 139.  
Naylor, 144.  
Beart, 138.  
Tuxford, 190.  
Gleason, 393.  
Eckert, 206.  
Poole, 211.  
Lawes, 14.  
Lawes, 218.  
Crosskill, 234.  
Coman, 241.  
Hacriotti, 255.  
Patterson, 278.  
Wilder 291.  
Uttina, 314.  
Cockey, Cockey, and Cockey,  
317.  
Coleman, 320.  
Raywood 335.  
Bavace, 351.  
Smith, 353.  
Day, 354.  
Marsden, 364.  
Bonick, 365.  
Cunbridge, 368.  
Harvey, 400.  
Moon, Bell, and Ewbank,  
423.  
Cainbridge, 433.  
Harvey, 445.  
Robinson 448.  
Fourman 470.  
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Thompson and Laszby, 493.  
Cartwright, 527.  
Fowler 555.  
Powell, Worby, and Greig  
(Schubert and Heese).  
570.  
Benton, 590.  
Barford, 607.  
B. n. y, 702.  
Gill, 705.

Elias 794.  
 Amos, Barford, and P  
 815.  
 Sheppard, 230.  
 Sp. 007 400  
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Williams, 431.  
Leslie, 424.  
Crompton, 733.  
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Thompson and Lott 67.  
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Gartell 121  
Raymond May, Biddell, 111  
Worthy 131.  
Beart 143  
Hansen 140, 100.  
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Norton 14, 74.  
Wenzel 150.  
Cullen 160 159  
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Coleman, 457.  
 Flournois, 476.  
 Clay, 498.  
 Williams, 521.  
 Seaman, 533.  
 Clay, 595.  
 Laidley, 608.  
 Alison, 648.  
 Weaver and Gall, 688.  
 Pinesh, 712.  
 Alsen, 772.  
 Gray, Gray, and Gray, 839.  
 Hall, 840.  
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Osborn, 155.  
 Whanna, 288.  
 Williams, 318.  
 Fisher, 444.  
 Fowler and Worby, 453.  
 Williams, 521.  
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 (Schubart and Hesse),  
 680.  
 Alison, 648.  
 Weaver and Gall, 688.  
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 Hall, 840.

**Screw, ploughing by:**

Southan, 266.  
 Bennett, 311.  
 Chamberlin, 325.  
 Platt, 402.  
 Breunand, 501.  
 Holmes (Romney), 704.  
 Brownan (de Gabrias), 726.  
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Hill, 25.  
 Wade, 26.  
 Hila, 41.  
 Hunt, 50.  
 Griffin, 73.  
 Hardy, 187.  
 Smith, 273.  
 Goodnow, 287.  
 Tynock, 310.  
 Boyd, 348.  
 Orway, 404.  
 Payne, 411.  
 Mottram, Edwards, and  
 Mitchell, 467.  
 Spence (Funderburg), 503.  
 Johnson (Gandel), 613.  
 Boyd, 676.  
 Clarke, 724.  
 Brooks, 860.  
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**Scythes, sharpening:**

Clark (Batel), 606.

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Nicholls, 160.  
 Newington, 171.  
 Ross, 179.  
 Newington, 184.  
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 Davis, 230.  
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**Seed, sowing broadcast:**

Horn, 12.  
 Tyrrell, 32.  
 Thomas and Lobb, 67.  
 Baedemer, 201.  
 Stansbury (Stevens, Crosby,  
 and Pearson), 331.  
 Broonan (Owen), 382.  
 Finlayson, 471.  
 Cahoon, 482.  
 Hughes (Beare and Bar-  
 ret), 511.  
 Newington, 525.

**Seed, treating:**

Van Oost, 150.  
 Bickes and Henry, 183.  
 Lester (Dunlop), 213.  
 Vassart (Dilliers), 303.

**Sewage, treating land with:**

Palmer, 122.  
 Footman, 710.  
 Nemo, 824.  
 Philrow, 841.  
 Lister, 864.  
 Borill, 868.

**Shafts for implements:**

Maggs, 240.

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ing machines.****Sickles:**

Wilde, 24.  
 Hutton, 43.  
 Hunt, 50.  
 Booth, 805.

**Signals for ploughing:**

Williams, 316.  
 Green, 689.  
 Green, 724.  
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paring.**

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Drills.

Spades:

Gedge (*Naslot*), 375.

Springs:

De Lowenthal, 474.

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bined:

Pape, 204.

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vators, ploughs, reaping  
machines, &c. *See* clod-  
crushers, cultivators,  
ploughs, reaping machines,  
&c.:

Steam, methods of applying  
power:

By means of traction ropes:

Henthley, 74.  
McRae, 66.  
Osborn, 163.  
Chapman, 253.  
Williams, 316.  
Lacy, 337.  
Fowler, 342.  
Smith, 343.  
Fowler, 344.  
Fowler and Greig, 349.  
Howard and Baker, 361.  
Fowler and Worby, 369.  
Foster, 381.  
Hawkes, 387.  
Williams, 397.  
Edlington, 413.  
Massey and Smith, 414.  
Fowler and Worby, 419.  
Lacy and Homersham, 431.  
Hajes, 434.  
Fowler and Worby, 438.  
Foster, 469.  
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Clayton and Oliver, 478.  
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Hall, 492.  
Clayton and Oliver, 497.  
Fowler, Burton, and Greig,  
509.  
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Fowler, Burton, Greig, and  
Hall, 513.  
Hall and Hall, 519.  
Williams, 521.  
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Steam, methods of applying  
power—*cont.*

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Romaine, 541.  
Burton, 546.  
Horroby, 551.  
Fowler, Burton, and  
Allen, and Worby, 558.  
Beards, 565.  
Hall, 574.  
Fowler, Worby, and  
(*Schubert and Heers*),  
588.  
King, 594.  
Romaine, 619.  
Lacy and Homersham,  
Howard and Housfield,  
Hornby, 630.  
Smith, 630.  
Howard and Housfield,  
Clay, 642.  
Tucker, 645.  
W. Lacy, 651.  
Romaine, 652.  
Fowler, 654.  
Hensman and Hens-  
man, 664.  
Steevens, 664.  
Howard and Housfield,  
Romaine, 684.  
Allen, 690.  
Weaver and Gell, 694.  
Hensman and Hens-  
man, 694.  
Hall, 695.  
Howard, Housfield,  
Phillips, 700.  
Parker, 705.  
Gill, 705.  
Fowler and Kite, 707.  
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 Manchester (Literary and Philosophical Society, George Street).  
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 Netherlands—Bibliothèque de l'École Polytechnique de Delft.  
 New Zealand—Athensium and Mechanics' Institute, Dunedin.  
 Russia—Imperial Technological Institute, St. Petersburg.  
 Turkey—Literary and Scientific Institute, Smyrna.  
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 United States—American Academy of Arts and Sciences, Boston.  
 ——— American Institute, New York.

United States—American Society of Civil Engineers, New York.  
 ——— Industrial University, Champaign, Illinois.  
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 ——— Young Men's Christian Association, Scranton, Pennsylvania.



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1. The first part of the document is a list of names and addresses of the members of the committee.





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